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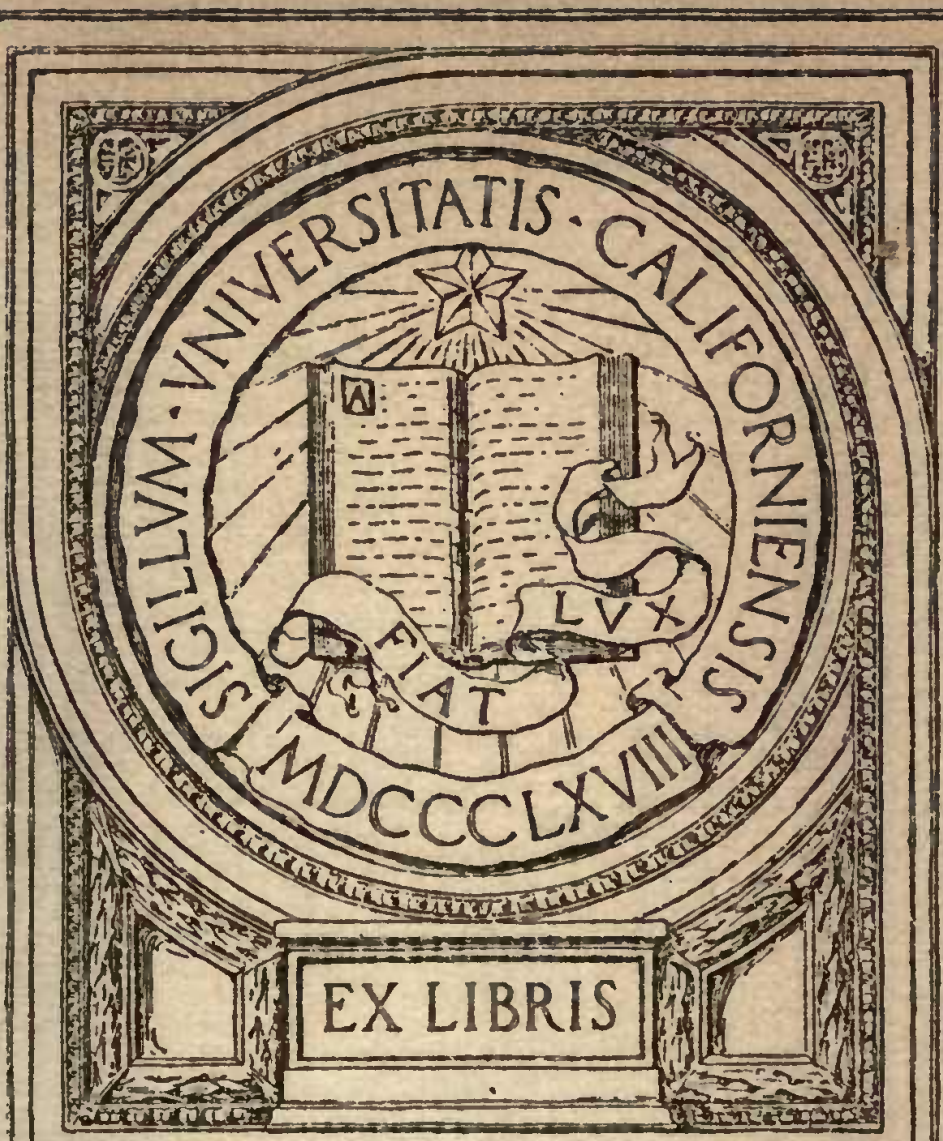

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WESTERN FLOWER GUIDE

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WILD FLOWERS OF THE ROCKIES AND WEST TO THE PACIFIC

Black

BY

CHARLES FRANCIS SAUNDERS

Author of "With the Flowers and Trees in California," etc.

Illustrated with 250 drawings in color

GARDEN CITY NEW YORK
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To be able to call the plants by name makes them a hundredfold more sweet and intimate. Naming things is one of the oldest and simplest of human pastimes.

—Henry Van Dyke, in "Little Rivers."

The illustrations for this book were prepared by the following artists: Herbert Brown, Jane Donald, Mary E. Eaton, Augusta A. Gleitsmann, Abby Reed Hobgood, M. R. Perkins, Maud H. Purdy and Bertha F. Taylor.

PREFACE

The preparation of a Pacific Coast Wild Flower Guide of the present small proportions has naturally involved a large exercise of elimination. The flowers herein illustrated number 250, and the brief descriptions in non-technical language include besides these a few more whose resemblance to certain of those depicted makes identification relatively easy. The selection of the subjects has been based mainly upon the hold which such flowers have upon the popular heart on the Pacific Coast, and also to some extent by the part they have played in the human life of the region. A few introduced plants—not uncommon in other parts of the world, and some of them even homely—have been included in the descriptions, because their abundance, their uses, or their habits make them subjects of interest to travelers and the general student.

While the region covered in the Guide is principally the three Coast States, California, Oregon, and Washington, in many cases the plants described are also found eastward in the States from Idaho south to Arizona, and in some cases as far east as Colorado, New Mexico, and Texas. Plains and valleys, seaside and mountains, as well as the Southwestern desert region (a marvellously rich floral field for a part of the year) are represented.

While this book has been prepared out of a personal acquaintance of many years with the field, the author desires to acknowledge his indebtedness to the following works upon which he has had occasion to draw for special descriptions and points—Gray's "Synoptical Flora of North America," Jepson's "Flora of California" (in course of publication), Hall's "Compositæ of Southern California" and "Yosemite Flora," Parson's "Wild Flowers of California," Armstrong's "Western Wild Flowers," Meehan's "Native Flowers and Ferns of the United States," and the valuable monographs of Chestnut, Coville, Havard, and Barrows on the Indian uses of native plants.

WESTERN FLOWER GUIDE

LILY FAMILY

(*Liliaceae*)

Usually perennial herbs, with regular and symmetrical flowers, the parts almost always in 3's or multiples of 3 inserted under the pistil. Petals and sepals are generally alike in shape and color, and are spoken of collectively as the perianth. Fruit a pod or berry.

MUILLA (*Muilla serotina*, Greene). A sprightly little flower of the spring, growing in grassy places in the plains and foothills of Southern California. The small, wheel-shaped, 6-parted blossoms are greenish-white, about half an inch across, and disposed in umbels of 40 to 70 flowers each, at the summit of a naked stalk, 1 to 2 feet tall, rising out of a bulb. Leaves all basal, about as long as the flower stalk, and very narrow.

There is another and less attractive species, *M. maritima*, Wats., with 5 to 15 blossoms in the umbels, found about salt marshes and in alkaline spots of Central California and Western Nevada.

The name Muilla is evidence that even scientists have their playful moods. Backward it spells Allium, the botanical term for onion, to which Muilla is akin though lacking its odor.

Desert Lily (*Hesperocallis undulatus*, Wats.). This is a charming spring flower of the southwestern desert region, occurring from the Salton Sink, California, eastward into Arizona, and southward into Mexico. Its crinkly basal leaves, a foot long and about half an inch wide, are characteristic. From their midst rises a stalk to the height of one or two feet bearing a few short leaves and an open raceme of 6 to 30 white, funnel-shaped flowers suggesting Easter Lilies. These expand from the buds on successive days until all have had their taste of life. The buds are so tenacious of this privilege that they will even open on severed stalks, as I noticed once when I threw some stems with their unopened buds into a waste corner of my garden. There, many days later, I discovered them blooming quite cheerfully—an example for the disheartened.

The deep-seated bulbs of the Desert Lily used to form an item of importance in the diet of the Desert Indians. It is, indeed, closely related to the edible Camass, and a no-distant cousin to the onion. Dr. D. T. MacDougal has recorded that the plant is reputed responsible for the name of the Ajo Mountains in Southwestern Arizona—*ajo*, the Spanish for garlic, being also the term locally applied to the Hesperocallis, which is very abundant in that vicinity.

WASHINGTON LILY (*Lilium Washingtonianum*, Kellogg). Flowers 3 inches long or more, very fragrant, pure white, becoming purplish, sometimes finely dotted, 2 to 20 or even more borne in a pyramidal raceme on a stem 2 to 5 feet high. Its favorite habitat is in chaparral or open-forested hillsides, mainly on the western slope of the Sierra Nevada at 3,000 to 6,000 feet elevation, though it has been collected as far north as the Columbia River and southward to San Diego County. It is met with in the Yosemite region though not abundantly, blooming in June and July.

This is a flower of such compelling charm that even the 'Forty-niners forgot their interest in the mad rush for gold long enough to observe and christen it the Lady Washington Lily—a name which our own less gallant generation has curtailed of its feminine tribute. When Doctor Kellogg later described the plant for science, he preserved the popular appellation.

A somewhat similar lily, with rather smaller and more erect flowers, is occasionally found in out-of-the-way parts of the Coast Range north of San Francisco—*Lilium rubescens*, Wats., popularly known as Chaparral Lily or Redwood Lily. It sometimes attains a height of 7 feet. Some botanists regard it as simply a variety of *L. Washingtonianum*.

LEOPARD LILY (*Lilium pardalínum*, Kellogg). Flowers nodding, bright reddish-orange, purple-spotted on the lower part, the tips strongly rolled back, borne in summer in numbers varying from 6 to 25 in loose pyramidal clusters that top stems from 3 to 7 feet high or even more. The lanceolate leaves are usually in whorls, but some are scattered. A mountain plant, most abundant in Central and Northern California in damp ground and along streams, both in the Coast Ranges and the Sierras, but extending north to British Columbia. It is often called Tige. Lily, a term more properly applied to the garden *Lilium tigrinum*, which it resembles.

A similar Lily abundant in the cañons of the Southern California mountains as well as in the Sierra foothills is Humboldt's Lily, *Lilium Humboldtii*, R & L, also popularly called Tiger Lily. The flowers are rather larger than the Leopard Lily's and the leaves usually in 4 to 6 whorls of 10 to 20 each, and wavy margined. There is also a radical difference in the bulbs, those of the Humboldt Lily being large, from 2 to 6 inches thick, while the Leopard Lily springs from mat-like masses of bulbs formed by branchingroot stalks. In the north Humboldt's Lily affects dry, open localities, but in the south it is found in dampish brookside tangles, too.

Fetid Adder's Tongue (*Scoliopus Bigelovii*, Torr.). This stemless plant is one of the earliest blossoms of the year, and may be looked for in February in the damp redwood forests from San Francisco northward. Out of the heart of two shiny green leaves blotched with brown, growing close to the ground, rise several weakish flower stems each terminating in a single flower of curious aspect, and an inch or so broad. The sepals and petals are markedly distinct—the three former lanceolate, spreading, whitish, striped with purple, and the 3 slender linear petals upright, like triple antennae. A prominent feature of the blossom is the 3-angled ovary tipped with 3 spreading style branches, each $\frac{1}{8}$ to $\frac{1}{4}$ inch long. The odd beauty of the little flowers is offset by a disagreeable odor which they exhale. The three-angled seed vessels, suggesting elongated beechnuts in shape but bearing still the triple-lobed stigma, are very decorative, the stems then becoming tortuous. The specific name is given in honor of Dr. John M. Bigelow, the botanist who discovered the plant, which furnished a new genus to science.

In the Cascade Mountains of Oregon a kindred species, but smaller in every way, *S. Hallii*, Wats., is found.

OUR LORD'S CANDLE (*Yucca Whipplei*, Torr.). This striking plant, common in the chaparral belt of the Southern California mountains and extending eastward to Arizona, is an evergreen hemisphere of bristling, bayonet-like leaves set close to the ground, each leaf 1 to 3 feet long and terminating in a slender spine. Out of this repellent mass arises in early summer a stout flower-stalk to the height of 10 to 15 feet, breaking for half its upper length into a huge panicle of creamy-white (sometimes purplish tinted), fragrant, pendent flowers. Such gleaming spikes, visible from long distances projected against the dark background of shaggy hillsides, are a characteristic sight in June and July throughout Southern California, and one of the dramatic scenes in Western plant life.

After the flowers pass the plant dies, but an examination at the base usually shows thrifty young offsets from the old root. The dead flower stalks, pithy and light of weight, are turned to some account by curio manufacturers, the cross sections, for instance, making serviceable pincushions. The young flower stalk was roasted and eaten by Indians.

Spanish Californians call the plant *quióte* (kee-ó-ta) which seems to be a case of popular transference, as *quiotl* is one of the Aztec names for the Agave, or Maguey.

JOSHUA TREE. TREE YUCCA (*Yucca arborescens*, TORR.). Flowers white, rather ill-smelling, and borne in panicles at the branch tips, much less noticeable than the plant itself, which is a small, grotesque tree, sometimes just a trunk with an odd limb or two, but in its best development 25 or 30 feet high, with numerous angular, clumsy branches. The dagger-like leaves are olive green bunched at the extremities of the limbs, and at first stand up straight. Gradually, however, they lose their uprightness, and when dead they are reflexed against the limb, forming a brownish thatch which is a protection against sand and hot wind. Desert folk call it Joshua Tree, Yucca Palm, and Yucca Cactus—the last two needlessly inaccurate, for it is neither Palm nor Cactus, and is a Yucca.

The spongy, fibrous wood, useless for ordinary purposes, is particularly suited for the manufacture of artificial limbs and surgeon's splints, and within the last couple of years the wood has been cut in great quantities to be used in the war hospitals of Europe.

The tree is confined to parts of the Mojave Desert of California, Southern Nevada, and Southwestern Utah, often forming straggling forests on the arid plains and hillsides.

FAIRY BELLS. GOLD DROPS (*Disporum Menziesii*, Benth & H.). Flowers smallish, white, bell-shaped, few and all but hidden from sight, hanging singly or 2 together on slender, axillary footstalks beneath the leaves, which spread like a roof above them. The plant is perennial and its general habit suggests the familiar Uvularia or Bellwort of the Atlantic Slope and, like it, grows in the rich, moist woods of spring. The graceful stems, rising from a slender rootstalk, spread out horizontally into numerous branches, and the stalkless somewhat heart-shaped leaves all lie in much the same plane with one another. It is a trim, well-groomed looking plant, found from San Francisco to British Columbia. The popular name, Gold Drops, is due to the bright salmon-colored pear-shaped berries, ½ inch long, that succeed the flowers.

Scientists, like common folk, do not always agree upon a Latin name acceptable to all for their plants, and instead of *Disporum* there are botanists who prefer *Porsartes*, under which name our flower is described in some books. There are 5 or 6 different species native to the Pacific Coast, all distinguished by drooping, more or less hidden, axillary flowers, and bright-colored berries.

California Wake Robin (*Trillium séssile*, L.). The trilliums are low-growing, perennial herbs of the spring, and readily distinguished by their stout, naked stems bearing at the top a whorl of 3 ample, netted-veined leaves in the midst of which the solitary flower opens. In *T. sessile* (a widely distributed species, represented on the Pacific Coast by a robust form which botanists designate as variety *californicum*), the flower is stalkless and sits upon the leaves, which are more or less blotched with brown. The petals are from 1 to 4 inches long, erect, and remarkable for their variability of color, usually purple or dull red, but even found white or greenish-yellow. The California Wake Robin is met with in moist hillsides and woods, from San Diego County, California, to Oregon, and blooms from March until May.

A less common species, indigenous to the Coast Range woods from Santa Cruz northward to British Columbia, is *T. ovatum*, Pursh. Its fragrant flowers are white, eventually turning to rose, and are borne on peduncles 1 to 3 inches long.

GOLDEN STARS (*Bloomeria aurea*, Kellogg.) This is a charming, bulbous plant bearing a showy umbel of sometimes as many as 60 star-like flowers (orange-yellow with a dark double mid-rib and sometimes an inch across) topping a scape 6 to 18 inches high. It is frequent on the mesas and foothills of Southern California from April to June, and might be mistaken on first acquaintance for a Brodiæa. The essential difference between Bloomeria and Brodiæa, however, is that the 6 stamens of Bloomeria arise from a tiny hairy cup formed by cohering, short appendages attached to the base of the filaments. It is a plant very economical of foliage, one long, grass-like leaf being sufficient for its needs. The bulb from which it springs was formerly an item in the diet of Southern California Indians.

In San Diego County, California, a kindred species, *B. Clevelandi*, Wats., is found, but is readily distinguished from *B. aurea* by its numerous slenderer leaves and the green nerves of the flowers. Neither is it so showy.

The name Bloomeria was given in honor of a pioneer botanist of San Francisco, H. G. Bloomer.

BRODIÆA. CALIFORNIA HYACINTH (*Brodiæa capitata*, Benth). Flowers deep blue to lilac, sometimes almost or quite white, in a compact, head-like umbel, borne at the top of a tortuous leafless stem from 6 to 20 inches high or more. Leaves radical, linear, grass-like, and early withering; from a small, fibrous-coated, solid bulb, which is edible.

This flower, found in bloom in grassy places and on sunny hillsides from February until May, throughout California, is almost as well known and loved as the California Poppy. Its popularity is attested by numerous common names, current in different sections of the state, as Cluster Lily, Cacamita, Grass-nuts and Wild Onion—the last two from the fact that the little bulbs have been eaten from time immemorial by Indians, and still are by children with patience to dig them up. The name Brodiæa commemorates an old-time Scotch botanist and plant lover, James Brodie.

The cut flowers of the Brodiæa keep a long time in water. Indeed, they can be counted upon to preserve their freshness when mailed across the continent. If well developed buds—not open flowers—are selected and packed immediately in some damp wrapping, they will stand a trip of 5 or 6 days in the mail bags, and expand cheerfully upon being set in water.

TWINING WILD HYACINTH (*Brodiæa volùbilis*, Baker). Flowers pink or rose color without, paler within, in a compact, many-flowered umbel, topping a contorted, leafless, vine-like stem. Leaves radical, grass-like, and usually prostrate, 1 to 2 feet long.

The Twining Wild Hyacinth is not uncommon in the Sierra Nevada foothill regions, from the neighborhood of Yosemite to Northern California, and is also found in the foothills of the Coast Ranges, blooming in summer. The remarkable feature of this plant is its odd vine-like stem, which clambers over bushes and around the stems of other plants, to the length sometimes of 10 to 12 feet. Miss Parsons in her excellent book "The Wild Flowers of California," has recorded that even if the stem should be broken off at the ground before blossoming, the process of flowering goes on quite undisturbed; and that people often bring the severed stems indoors, where they can watch the interesting phenomenon of growth, allowing them to climb over the curtains.

HARVEST BRODIÆA (*Brodiæa grandiflora*, Smith). Flowers blue, an inch or so long, funnel-shaped, with a spreading border, like small blue Lilies, borne in a loose 5-10 flowered umbel, on a leafless stalk from a few inches in height to a foot or more. The grass-like, radical leaves usually dry up and vanish before the blossoms come, which is usually in May, June, and July, when the hay harvest is in progress. The species is common in fields, grassy hillsides, and woodland glades throughout Central California and northward through Oregon and Washington. The solid bulb is edible, and a favorite tidbit with Indians. After slow roasting in hot ashes it becomes sweet and not unpalatable.

There is a related blue-flowered species, *Brodiæa laxa*, Benth, found frequently in similar situations, but this plant is usually taller, the flowers less spreading, more numerous, and of a papery texture. It, too, was once a highly prized vegetable among the Indians of Northern California, and the use of the bulbs for food gained for it the common name of "Highland Potato" in some sections. A more poetic common name for this species is Ithuriel's Spear, though the appropriateness is not apparent. It has been collected as far south as Los Angeles.

FIRECRACKER FLOWER (*Brodiæa coccínea*, Gray). Flowers an inch long, tubular, brilliant crimson, with green tips, pendulous, in a loose umbel, produced at the summit of a leafless stem, 1 to 3 feet tall. Leaves grass-like and radical, as with most species of Brodiæa. Cañons and open rocky mountain woods of Northern California and Oregon, blooming from May to July.

Firecracker-flower (or Firecrackers, a terse variant) is one of all too rare instances of a popular name of obvious appropriateness; for the drooping, crimson clusters of long, straight blossoms bear a striking resemblance to a little bunch of Chinese firecrackers. An account of the plant's discovery by its first scientific describer, Dr. Alphonso Wood, is pleasantly given by Mr. Thomas Meehan in "The Native Flowers and Ferns of the United States." It was pointed out to Professor Wood by a stage-driver in the Trinity Mountains, as a flower so beloved by his little daughter Ida May, that the family called it after her, Ida May. Wood, in describing the plant, believed it of a new genus, which he called *Brevoortia*, and sought to preserve the sentiment of this particular species by naming it *Brevoortia Ida-Maiæ*. Most later nomenclaturists have discarded his name for the one given at the head of this page.

GOLDEN BRODIÆA (*Brodiæa ixioides*, Wats.). Flowers funnel-formed, yellow, the spreading divisions with a brown mid-vein—a charming plant 6 inches to 2 feet high, found in the Coast Ranges and Sierra Nevada (including the Yosemite region) from the Santa Inés Mountains in Southern California northward to Oregon, blooming in summer.

The Golden Brodiæa is likely to deceive the novice into thinking it *Bloomeria aurea*. The flower of the latter, however, is distinguished by a tiny cup out of which the stamens rise, and the stamen filaments themselves are thread-like. In the Golden Brodiæa, the stamens have broadly winged filaments the whole length.

In the higher Sierras, at about 8,000 feet and upward, there is another yellow Brodiæa often found, which closely resembles *B. ixioides*, but is a smaller plant in every way. It is *Brodiæa gracilis*, Wats. The main botanical distinction is in the filaments, which are thread-like in *B. gracilis*, instead of winged.

Some botanists split the genus *Brodiæa* into three—*Brodiæa*, *Hookera*, and *Triteleia*—and by these nomenclaturists our Golden Brodiæa is classed with *Triteleia*.

LANTERN OF THE FAIRIES (*Calóchortus albus*, Dougl.). Flowers nodding, satiny white, sometimes with a tinge of purple, the petals arching inward and forming a closed bell or globe, hairy within; solitary or few, terminal on the branches. Stems leafy-bracted, 1 to 2 feet high, and branching; radical leaves ½ to 2 inches wide. Blooming in late spring or early summer in shady situations, particularly in the Coast Ranges and the Sierra Nevada, from San Diego northward.

The genus Calochortus numbers about forty species, nearly all confined to the Pacific Coast, though a few occur in the Rocky Mountain region, and even as far east as the Dakotas and Nebraska. One *C. Nuttallii*, T. & G., popularly known as Sego Lily, is the State flower of Utah. The Lantern of the Fairies belongs to the section of the genus known as Globe-tulips, because of the shape of the flowers, and is one of the daintiest creations imaginable. Paraphrasing a certain old dictum about the strawberry, one might say that doubtless God could have made a lovelier flower, but never did.

A charming cousin of *C. albus* is the yellow Globe-tulip, *C. pulchellus*, Dougl., somewhat similar in make-up, but with yellow flowers. It is a Central Californian.

MARIPOSA TULIP. MARIPOSA LILY (*Calochortus catalinæ*, Wats.). Flowers 2 to 3 inches across, tulip-shaped, erect and terminal on loosely branching stems 1 to 2 feet high; white or lilac with a dark-red blotch at the base of each petal. Leaves grass-like. Common throughout Southern California and the Coast Islands, on plains and foot hills, blooming from February until May.

The name Mariposa, applied to this charming flower, is adopted from the Spanish-Californians and means "butterfly." The appropriateness of the term will be denied by no one who comes for the first time upon a patch of the showy, exquisitely mottled flowers, gleaming like resting butterflies indeed, amid some sunny expanse of wild grasses.

The relationship of Calochortus is nearer to the Tulip of the Old World than to the Lily, a fact which makes the popular term Mariposa Tulip more accurate for it than the more generally used Mariposa Lily. Many of the species so closely resemble one another, and are so variable, that it is work for an expert to identify them. *C. catalinæ* derives its specific name from the fact of its having been first described from a specimen collected some 40 years ago on Santa Catalina Island.

DESERT MARIPOSA (*Calochortus Kennedyi*, Porter). Flowers a couple of inches across, flaming vermilion, tulip-shaped, erect at the tips of stoutish stems from a few inches to a foot or more high. Leaves grass-like, often withering away before flowering. Blooming in April and May on the Mojave Desert, California, eastward to Arizona.

Motorists of an observant sort and leisurely gait across the Southwestern desert roads in spring, can hardly fail to be attracted by the sight of this glorious flower. In open spaces where the sun has full power, it blooms close to the sand, but in the protection of a bush the stem has a chance to develop and the flowers are more aspiring. The wonder of it is increased by finding it in the midst of such barren sun-scorched wastes as popular speech calls "God-forsaken." The flower is a reproach to such a phrase, and seems to preach to us the universality of the divine providence.

The Desert Mariposa in California is of rather local occurrence. Miss Armstrong, in her "Field-Book of Western Wild Flowers," speaks of it as so abundant in localities in Arizona as to lend color to the landscape for miles. An interesting feature of the plant is the elongated and very decorative seed-vessel, vertically banded in white and green.

MOUSE EARS (*Calochortus Maweanus*, Leich). Flowers, erect in anthesis, barely an inch across, bell-shaped, white or lilac, thickly covered with conspicuous white or purplish hairs. Stems low and branched, bearing a few grass-like leaves. Blooms in early spring, and is common in moist situations of the Coast Ranges and Sierra foothills from Central California northward into Oregon.

Calochortus Maweanus (the queer specific name, by the way, commemorates George Maw, an English horticulturist, author of a fine work on the genus Crocus) belongs to that section of the genus called Star Tulips. The noticeable furriness of the petals has associated the delicate little plant with cats, even more than with mice, and it is quite well known as "pussy's ears" and "cat's ears," as well as "mouse ears."

Quite similar in character are two other small plants of the genus, found also in Central and Northern California. These are *C. umbellatus*, Wood, whose petals, however, lack the characteristic hairiness of *C. Maweanus:* and *C. Benthami*, Baker, the Yellow Pussy's Ears, readily distinguished by the yellow color of the petals.

GOLDEN TULIP (*Calochortus lúteus*, Dougl.). Flowers erect, cup-shaped, rather small, greenish-yellow to orange, with a tendency to purple within; stems 4 inches to 1 foot high; leaves very narrow and grass-like. Widely distributed throughout California and blooming in spring and summer.

The Golden Tulip is very variable and its varieties *oculatus* (having eyes) and *citrinus* (lemon yellow) are more attractive to most tastes than the type—more beautiful daughters of a beautiful mother. Of variety *oculatus*, the distinguishing feature is a brownish spot usually fringed with yellow in the midst of the whitish or purple petal. Variety *citrinus* is characterized by deep or lemon yellow petals with a maroon eye central on each. In both varieties there is usually present below the eye a hairy, crescent-shaped honey-gland that adds a piquant touch.

Most species of Calochortus have played an important part in the aboriginal bill of fare, the corms or bulbs having been dug up and eaten either raw or after roasting in hot ashes. Besides being nutritious, they possess an agreeable sweet, nutty flavor, which is further developed by cooking. Like the bulbs of Brodiæa, those of Calochortus are sometimes called Indian or Wild Potatoes in Northern California.

CAMASS (*Camassia esculenta*, Lindl.). Flowers showy, 6-parted, deep blue to whitish, an inch or more in diameter, borne in a loose raceme at the summit of a scape 1 to 2 feet high. Leaves radical, numerous, and grass-like. It blooms in summer and is abundant in damp meadows and swampy places from Central California to Washington and east to Idaho and Utah.

There are several species of *Camassia*, most if not all having edible bulbs. Those of *C. esculenta* were until recently an important item in the dietary of the Northwestern Indians, and one of our Indian wars was caused by the encroachment of white settlers upon the immemorial Camass meadows of the Nez Percés. Pioneers of a few generations ago used to marvel at the blue expanse of the wild Camass fields, sometimes simulating lakes of clear water. The bulbs, resembling small onions, are nutritious and well charged with sugar. Usually they were dug in June or July and baked in heated pits after a rather elaborate process, which developed the innate sweetness; but often they were consumed raw, in which state they are crisp and mucilaginous, but rather tasteless. Lewis and Clarke in their journal speak of a feast tendered them by the Indians, in which the Camass played a conspicuous part.

SOAP-PLANT. AMOLE (*Chlorógalum pomeridianum*, Kunth.). Flowers opening in the afternoon, of 6 white, recurving segments, veined with purple, borne in a loose, spreading panicle at the top of an almost leafless stem sometimes 5 feet high. The basal leaves are very characteristic, 8 to 18 inches long, ½ to 1 inch broad, crinkly and wavy-margined, usually flat to the ground, noticeable for months before the flowering stem appears. Of wide distribution throughout California, on plains and dry hillsides; blooming from May to July.

Few wild plants have played so conspicuous a part in the human activities of the Pacific Coast as this, because of its bottle-shaped bulb, deep-buried and hidden within a coarse, fibrous, brown jacket. This fibre was utilized for brushes by the aborigines. The bulb itself contains a thick juice which when cooked has value as a glue. Of the roasted bulbs poultices were made, and the fresh bulbs mashed and thrown into a stream had the effect of temporarily stupifying fish, which were then easily captured. Chlorogalum's most famous use, however, is as soap. The mature bulb is rich in saponin, and when crushed and rubbed up in water produces a cleansing lather. Amole (*a-mólā*) is the Spanish name for the plant.

Mission Bells (*Fritillaria lanceolata*, Pursh.). Flowers nodding, bronze-colored, checkered in purple and dull yellowish-green, borne in a raceme on a stem 1 to 2 feet tall. Leaves lanceolate, 2 to 5 inches long in 1 to 3 scattered whorls. Flowering in the spring in rich woodlands of the Coast Ranges from Monterey Bay to British Columbia.

An interesting feature of this plant is the white, cone-shaped bulb, around which a family of baby bulblets (each resembling a grain of rice) are clustered like chicks about a mother hen. Please take my word for this, and do not disturb the hopeful family; for upon the undisturbed development of the little bulbs the future race depends.

The Fritillarias are near akin to true Lilies, and like them are of world-wide distribution throughout the north temperate zone in numerous species, of which the Crown Imperial of our grandmothers' gardens and ours is a well known and cherished example. The queer name Fritillaria is Middle Age Latin for checker-board, and would seem to have been suggested by the checkered segments of the flower.

CHOCOLATE LILY (*Fritillaria biflora*, Lindl.). Flowers nodding, bell-shaped, brownish-purple tinged with green to dark brown or nearly black, borne from 1 to 3 (sometimes as many as 10, according to Miss Parsons) on a stem from 6 to 18 inches high; leaves lanceolate, 2 to 4 inches long, scattered or somewhat whorled and mostly near the base. Blooming from February till April in open places in the California foothills and on grassy slopes from San Diego to Mendocino, but commonest in Southern California.

The Chocolate Lily is the Cleopatra of the Fritillarias—the darkest, and one of the loveliest, of a genus that is a source of peculiar delight to the flower lover. Of the 10 or 12 species indigenous to the United States, all are Western (most of them confined to the Pacific Slope) and are of several different colors. The Yellow Fritillary (*F. pudica*, Spreng.) is a pretty favorite, in yellow, with children of Nevada and Utah; *F. recurva*, Benth, is regal with racemes of flowers scarlet without, and orange and scarlet within, borne on stems a foot to a foot and a half high. It is found in the mountains of Northern California and of Oregon. There is also a species, *F. liliacea*, Lindl., with greenish-white flowers, which one occasionally comes upon in Central California.

ZYGADENE (*Zygadènus Fremonti*, Michx.). Flowers star-like, ½ inch or so in diameter, white or fringed with green, the 6 spreading segments each with a greenish-yellow glandular spot at the base; borne, few to many, in a raceme or panicle at the summit of a stem 1 to 3 feet high. Leaves grass-like, mostly basal, but a few short ones, sheathing at base, scattered along the flower-stem. Widely distributed from San Diego to Northern California, in the foothills of the Coast Ranges, on sunny mesas, and sometimes in marshy meadows. Blooms in March or April.

This beautiful flower has a black sheep of a cousin, the poisonous *Z. venenosus*, Wats., blooming in early summer in moist situations from Central California to British Columbia, and known as Death Camass. It may be distinguished from *Z. Fremonti* by smaller flowers with stamens that equal or exceed the perianth, and quite narrow leaves usually folded. The poisonous part of Death Camass is the bulb, taken internally, and as this is almost identical in size and appearance with the edible Camass bulb and frequently grows in the same places, cases of fatal human poisoning have not infrequently resulted. Pigs, they say, digest Death Camass readily enough, and like it, whence it is sometimes called Hog's Potato.

CHAMISE LILY. DOG'S-TOOTH VIOLET (*Erythronium gigantèum*, Lindley.) Flowers yellow or cream color, often with a maroon band at the base, the segments 1 to 2 inches long, revolute; borne 1 to 6 or more in a loose raceme on a leafless stem about a foot high. Leaves two, appearing basal, 6 to 10 inches long, dark green, mottled in brown. Blooming in spring and early in summer in rich woods of the Coast Ranges from Central California to Southern Oregon; one of the most magnificent of wild flowers.

There are several species of Erythronium in white and yellow, scattered over the Pacific Slope, all with a family resemblance to this, and you have only to see them once to be in love with them always. The name Chamise Lily is Northern Californian, given because of the flower's blooming sometimes amid the chamise or thickets.

The bulbs of the Chamise Lily are edible and were used to some extent by the Northern California Indians. Mr. V. K. Chesnut has recorded a curious belief of one tribe who thought washing themselves with a decoction of the bulbs would prevent the rattlesnakes from having dreams, which in their mind made the snakes more irritable and dangerous!

Squaw Grass (*Xerophyllum tenax*, Nutt.). Flowers white, showy, $\frac{1}{2}$ to $\frac{3}{4}$ inch broad, fragrant, in a dense raceme sometimes a foot long, the lower blossoms expanding first, borne at the summit of a bristly stem 2 to 5 feet high, arising from the midst of a large tuft of very narrow, grass-like leaves, dry and harsh to the touch, that spread outward and droop in a way suggesting a fountain. Mountains of Central California northward through Oregon and Washington; blooming in early summer and sometimes whitening extensive meadows with their showy bloom.

Another species, *X. Douglasii*, Wats., similar but in every way smaller, occurs in Oregon and eastward to the Yellowstone, and if you have ever botanized in the pine-barren regions of the Atlantic coast states, either will remind you of the charming Eastern cousin of both, *X. setifolium*, Michx., or Turkeybeard.

The botanical name Xerophyllum, meaning dry leaf, well describes the peculiar dry roughness of the foliage. The common name Squaw-grass is due to the fact that the Indian women use the grass-like leaves in the weaving of some of their best baskets.

False Hellebore. Skunk Cabbage (*Verátrum californicum*, Durand.). Flowers greenish-white with a green base in a large panicle, 1 to 2 feet long, containing both perfect flowers and those of separate sexes, on stout stems 3 to 7 feet tall, with plaited, sheathing leaves. Blooming in summer in mountain meadows and along streams in most parts of California, north to Oregon and east to Wyoming and Colorado.

The False Hellebore is one of the most showy of mountain plants, chiefly because of its leaves. These have a pronounced allurement from the time they appear in the early spring until the frosts of autumn turn to gold the natural plantations of them that beautify many a mountain meadow.

There are two other species indigenous to the Pacific Coast, *V. fimbriatum*, Gray, a peculiar species of which the flowers are fringed and spotted, and *V. viride*, Ait. The latter with green flowers, and a slenderer plant in every way than *V. californicum*, occurs in the East as well as the West, and is the celebrated Indian Poke, of which a decoction was used by the aborigines as an emetic. It is said some tribes resorted to it in the selection of their chiefs—the candidate who could most effectively stand up under the successive doses, being regarded as the fittest to govern.

CLINTONIA (*Clintonia Andrewsiana*, Torr.). Flowers ½ inch or so long, red or pink, in a many-flowered globose-umbel topping a stout, leafless stem 1 to 2 feet high, which also usually bears one or more smaller flower-clusters along its length; leaves radical, glossy green, often a foot long. Blooms in the spring and early summer in the redwood forests of the Coast Range from Monterey Bay northward—the flowers succeeded in summer by berries of the richest blue, as distinguished in their way as the blossoms.

Any one familiar with the lovely *Clintonia borealis* of Eastern woods will recognize at once this, its regal sister of the Far West. There is also another Pacific Coast species, *C. uniflora*, Kunth., with a short stem bearing one or two dainty white flowers with yellow centres, rising out of two or three shining green leaves.

Clintonia immortalizes the name of DeWitt Clinton, some time governor of New York, and is whimsically associated with Thoreau, who in one of his books says some crabbed things about linking "a politician's" name with such a beautiful flower. As Clinton had a penchant for natural history as well as for politics, doubtless the name is well enough bestowed. Andrews was a California botanist of half a century ago.

AMARYLLIS FAMILY

(*Amaryllidaceæ*)

Perennial mostly herbaceous plants, resembling the Lilies, but distinguished by having the lower part of the perianth adherent to the surface of the ovary, thus giving the appearance of the flower's being set above the ovary. Stamens 6. Leaves usually basal, without distinction of blade and petiole.

MESCAL (*Agáve desérti*, Englm.). This is a cousin of the well known Century Plant or Maguey of Mexico, and is found on the sun-scorched, desert-facing slopes of the Southern California mountains. While in general aspect resembling the Century Plant, it is smaller, with clustered basal leaves, fleshy, spiny-pointed and rarely over a foot long. For years the plant grows slowly without any sign of flowering, until some March or April a stalk starts up, resembling a gigantic asparagus sprout and rising rapidly to a height of 8 or 10 feet and opens out a panicle of succulent, bell-shaped yellow flowers. Then follows death. The Indians made great use of the Mescal plant getting a good textile fibre from the leaves, while the base of the young flower stalks baked for a day in a hot, covered pit furnished a nutritious item of food, which they call *Mescal*.

IRIS FAMILY

(*Iridaceæ*)

Herbaceous perennial plants, with narrow leaves folded lengthwise, each embracing the next within. Flowers showy, perfect, but often irregular, of six segments, apparently set above the ovary, as in Amaryllidaceæ, but distinguished from the latter by having only 3 stamens.

Blue Eyed Grass (*Sisyrinchium bellum*, Wats.). Flowers deep blue with a yellowish centre, six parted and spreading, star-like, borne in loose umbels at the top of branching, flattish stems a foot or so tall. Leaves basal and grass-like. Blooming in spring and summer, in grassy places from near sea level.

This is one of the most sociable of wild flowers on the Pacific Coast, and far from being scared away by the settlements of men, seems to thrive in human companionship. Its pretty flowers are short lived, hardly outlasting a day, but as fast as one withers another opens and a single plant will thus remain a cheerful sight for a long time. The Indians found a medicinal use for the root, which is purgative, and Spanish Californians (who call it *Azúlea*, from *azul*, blue) used to make a tea of the plant, and perhaps still do, for use in fevers.

BLUE FLAG (*Iris Macrosiphon*, TORR.) The general features of the iris flower are too well known to need itemized description here. This genus is represented on the Pacific Coast by eight or nine indigenous species, mostly plants of the mountains. The flowers vary from deep purple, blue or lilac to yellow and white, often with beautiful veining in one color or another, and well justifying the name of Iris, which is Greek for rainbow.

Iris Macrosiphon, usually blue-flowered, is sometimes called Ground Iris from its frequent habit of growing in mats over the ground, and is found wild from the San Francisco Bay region northward, blooming in spring and summer. The flower stalks are shorter than the numerous, erect, narrow leaves which are from 6 to 20 inches tall. A characteristic feature of the flower is the slender, stem-like tube of the perianth, which extends 1 to 3 inches beyond the ovary—a character shared, however, by *Iris Douglasiana*, Herbert, a stouter and taller species of the same range.

Mr. Chesnut records a very human use to which some of the California Indians put the leaves of the flag. When the squaws went berry hunting in the hot hills, they would wrap the babies accompanying them in the soft, flexible iris leaves, thus retarding perspiration and staving off thirst from the little folks.

ORCHID FAMILY

(Orchidaceæ)

Perennial herbs with flowers of remarkable, sometimes grotesque shapes, of six segments; the three outer (sepals) similar to one another and petal-like, two of the inner (lateral petals) alike, but the third (the lip) is usually markedly different, generally very prominent and often spurred. Stamens, 1 or 2, united with the style into an organ called the column. Leaves alternate, parallel-veined.

Lady's Slipper (*Cypripedium montanum*, Dougl.). Flowers 1 to 3 on a leafy stalk a foot or two high, the lip in the shape of an inflated sac, an inch or so long, white with purple veins, the stringy sepals and wavy-twisted lateral petals purplish brown. Blooms in early summer, in moist Sierra woodlands from Central California (the Yosemite region) northward, and in the Coast Ranges in late spring. A plant that is all the lovelier because of its comparative rarity.

One other species may be met with in Northern California swamps and moist grounds—*C. californicum*, Gray, distinguished by a taller stem, more numerous blossoms and greenish-yellow sepals hardly half an inch long.

STREAM ORCHIS (*Epipáctis gigantéa*, Dougl.). Flowers 3 to 10, in a terminal, bracted raceme, on a leafy stem 1 to 4 feet high, or even 6 feet under special conditions. Sepals yellowish-green, petals pinkish with purple veining; lip, barely $\frac{1}{2}$ inch long, the baggy base with erect, wing-like margins, and a pendulous tip. Blooms from May to July along the banks of shaded streams and in wet clearings throughout California, northward to Washington, thence eastward to Nevada, Colorado and Western Texas.

Before flowering the stoutish stems of *Epipactis*, with its numerous clasping, parallel-nerved leaves 3 to 8 inches long, might easily be mistaken for a Veratrum or False Hellebore. For this reason early botanical writers gave to the European *Epipactis palustris* the name Helleborine, by which term our species sometimes goes in literature. It is the most commonly encountered of Pacific Coast Orchids, and at times occurs in patches of considerable size; but oftenest the plants are found in small scattered groups or even in solitary state, having little influence in the general picture.

The Indians of Northern California formerly thought they found medicinal value in the fleshy roots, and made a decoction of them for internal use when they felt "sick all over."

GHOST FLOWER. PHANTOM ORCHIS (*Cephalanthéra oregana*, Reich. f.). Flowers very much as in *Epipactis*, but pure white, in terminal spikes, a foot or two high, leaves reduced to scales, and the whole plant, leaves and stems as well as the blossoms, pure white, or nearly so. Blooming in summer in mountain woods from Central California and the Yosemite region northward to Oregon. A wraith-like plant when seen against the dark background of the forest floor, well described by the popular name. The flowers exhale a delicate odor that suggests vanilla.

This remarkable Orchid, first collected by the botanist Nuttall in Oregon, is one of that curious sort of plants of which the Heath family harbors several, that do no food manufacturing for themselves, but live like fungi on the decaying vegetation—the natural garbage—of the woods. This accounts for the whiteness of all the parts, which is simply an absence of chlorophyl, that essential agent by which other plants convert into nutriment for themselves the inorganic matter derived from earth and air.

The plant is called by some botanists *Cephalanthera Austinæ*, Heller.

LIZARD-TAIL FAMILY

(*Saururaceæ*)

Perennial herbs with perfect flowers without petals, calyx when present often colored like a corolla. Stamens 6 to 8.

YERBA MANSA (*Anemopsis californica*, Hook). Flowers small, in a compact conical spike, surrounded at the base by a showy white or pinkish involucre of several persistent bracts resembling a corolla, at the summit of a few-leaved, reddish stalk. Basal leaves numerous, long-petioled, like those of the common dock. In bloom from March till August in low wet and alkaline places in the central valley of California, throughout Southern California and east to Utah and Western Texas.

The creeping rootstock of this famous plant is peppery and astringent, and has long been prized as a household remedy by Californians. The dried root is chewed for troubles of the mucous membrane; and an infusion of the root is applied outwardly for rheumatic pains and skin troubles. A mash of the leaves is also used as a poultice for sores. The name Yerba Mansa, "tame herb" is quite meaningless. A Spanish lady of my acquaintance has stated that the true name is *Yerba del Manso*, the herb of the tamed Indian.

BIRTHWORT FAMILY

(*Aristolochiaceæ*)

Perennial herbs or twining shrubs with more or less heart-shaped leaves. Flowers without petals, the 3-lobed calyx corolla-like. Stamens 6 to 12, attached to the pistil.

WILD GINGER (*Ásarum caudatum*, Lindl.). Flowers on slender footstalks, brownish, bell-shaped, the three divisions extended into long tails. Leaves large, long-petioled, green and kidney-shaped, these and the flowers arising from root-stocks creeping at the surface of the ground. Blooming in the spring in damp woodlands from Monterey Bay to British Columbia. Frequent in the redwood belt.

The delightful aromatic fragrance of the crushed leaves and of the root suggesting ginger, makes it easy of identification even when out of flower, and justifies the common name. It is in no way related to the true ginger, and I find no record that the Indians ever found use for this one. The flowers are borne close to the ground.

In the Sierra Nevada another species occurs, *A. Hartwegi*, Wats., with smaller but similar flowers and leaves mottled with white.

BUCKWHEAT FAMILY

(*Polygonaceæ*)

Shrubs or herbs with usually alternate entire leaves and sheathlike stipules about the swollen joints of the stems. Flowers small, regular; petals none, the calyx 5-6 parted, often colored resembling a corolla. Stamens 4 to 9 inserted near the base of calyx; styles 2 to 4, ovary superior. Fruit a triangular or lens-shaped achene.

TURKISH RUGGING (*Chorizánthe staticoides*, Benth). Flowers usually reddish, but sometimes white, small, 1 to 3, included in a tubular ribbed involucre, tipped at its lobes with hooked spines. Stamens 9 or 6. Leaves mostly in a basal rosette which disappears early. Blooms in the dry days of summer, on arid hillsides and plains, Southern and Central California.

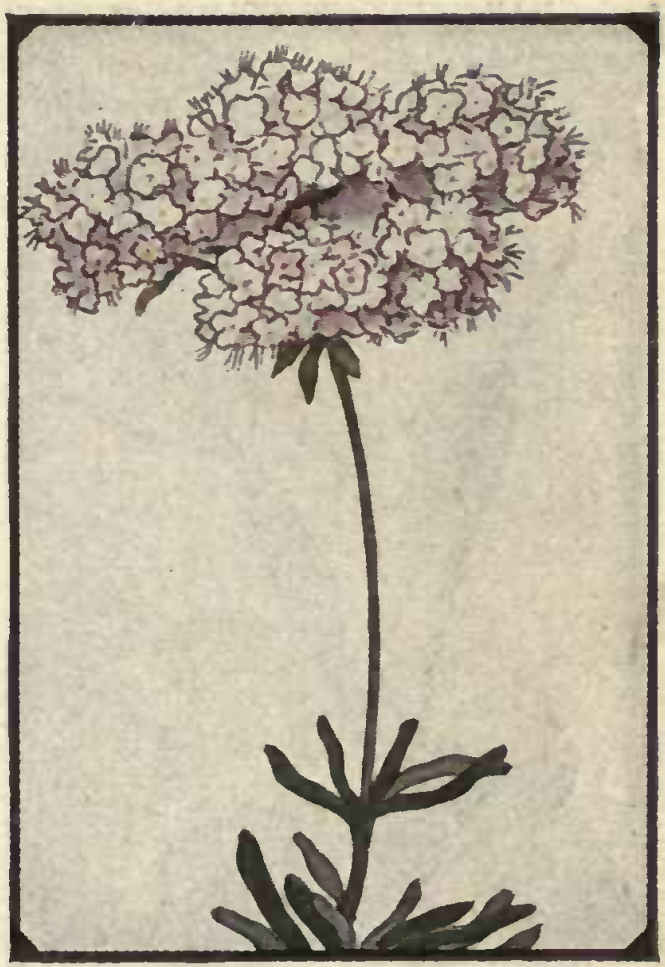
This odd, much-branched, all but leafless little plant, exceedingly brittle when dry, and very rosy in stem and branch, is often an influential factor in the color scheme of the dry hillsides of summer, spreading low over considerable areas.

The genus *Chorizanthe* is represented on our Pacific Coast by some thirty species, plants of the deserts and dry hills, and the unraveling of many of the species is an expert's job.

WILD BUCKWHEAT (*Eriógonum fasciculatum*, Benth). A small shrub, 2 to 3 feet high, with little white or pink flowers borne several in an involucre which is toothed but not spiny-tipped as that of *Chorizanthe* is, the flowers disposed in dense terminal heads. Leaves narrow, revolute margined, woolly beneath, much fascialed or bunched along the stems. Blooming throughout the spring and summer on mesas and hillsides of Southern California, eastward to Nevada and Arizona.

This is one of the most characteristic plants of the chaparral in Southern California; not only when, in bud and bloom, its massed delicate color lends a special charm to the foothills where it grows, but later also when the creamy tints of the flowers suffused with pink give place to the warm brown of the fruiting heads. It is one of the most cherished of wild flowers by the bees, and the honey of the Wild Buckwheat ranks in excellence only second to the White and Black Sages. Although the high tide of its bloom is from April until August, one is pretty sure to find scattering bloom at other seasons, too, even in midwinter.

The flowering heads have a tendency to dispose themselves in flattish clusters, whence another common name Flat-top.



DESERT TRUMPET (*Eriógonum inflatum*, Torr. & Fr.). The Desert Trumpet is so remarkable in its make-up that it may be recognized at a glance, and to see it is to be interested in it immediately. From a cluster of small heart-shaped leaves—one or more queer, glaucous, bluish-green, hollow stalks arise, swollen out sometimes to the diameter of an inch or so, and these are topped by an intricate net-work of slender branches and branchlets, bearing a multitude of tiny yellowish flowers. The plant grows from 1 to 3 feet tall, and is a desert dweller, abundant on the Colorado and Mojave Deserts of California, thence east to Utah, Arizona (Grand Cañon region) and New Mexico.

The inflated stalks, swelling upward gradually like a musical horn, explain the popular designation Desert Trumpet. Another name given in some localities is Pickles, the reason for which is not apparent, until one learns that the plant (like its relative the Sheep Sorrel) is acid, and the inflated stems when young and tender are eaten raw as pickles by some desert folk. I have also heard it called Wild Asparagus from a resemblance of the tangle of the blooming panicles to Asparagus plants in flower, but this name is misleading.

KNOTWEED (*Polygonum bistortoides*, Pursh.). The common smartweed of old truck-patches and roadsides the country over is represented on the Pacific Slope by a pretty cousin, the Alpine Smartweed, or Knotweed, frequent in wet meadows of the higher mountain ranges. In summer, campers and trampers come upon acres of it forming unbroken sheets of creamy white color in the damp sunny openings of the forests of the San Bernardino Mountains, the Sierra Nevada, and northward, as well as eastward to the Rockies. The small white or rosy, pediceled flowers are disposed in dense spike-like racemes $\frac{3}{4}$ to $1\frac{1}{2}$ inches long, on stems 1 to 2 feet high. The leaves are mostly basal, but a few are on the stem, grass-like and sheathing about the swollen stem-joints which are a characteristic feature of the Polygonums.

The specific name *P. bistortoides*, meaning like a *bistorta*, has reference to the resemblance of our plant to a species of Polygonum of very wide distribution called Bistort by Old World herbalists, from its tortuous and twisted roots.

Sulphur Flower (*Eriógonum umbellatum*, Torr.). The genus Eriogonum is one that we have to go to the Far West to find at home, but there it is extremely abundant. Of the 140 species or so, fully half are indigenous to our Pacific Coast, and the identification of the species in many cases is work for the patient special student. The flowers, numerous but small, are six-parted, colored in the different species white, pink, or yellow, and when faded still cling to the achene. Stamens 9, styles 3.

Of the few species that have attained popularity enough to acquire a common name, the Sulphur Flower is deserving of especial mention. The umbeled heads of fragrant, sulphur-yellow flowers terminate a reddish stem about a foot tall, that rises from a rosette of grayish green leaves white-woolly beneath. It is rather variable in its characters and botanists have proposed a number of varieties. In summer its cheerful colonies often cover large areas on dry, open mountain slopes of the Sierra Nevada and Coast Ranges, at an elevation of from 4,000 to 9,000 feet in California, north to Washington and eastward to the Rocky Mountains.

FOUR O'CLOCK FAMILY

(*Nyctaginaceæ*)

Usually succulent herbs or low shrubs with fragile stems and swollen joints, and opposite entire leaves. Perfect flowers, without corolla, but the delicate calyx colored like a corolla.

California Four o'Clock (*Mirabilis californica*, Gray.) Flowers magenta, open bell-shaped, the spreading lobes deeply 2-cleft, each flower in an involucre, disposed in terminal clusters or solitary in the axils. The blossoms expand about the middle of the afternoon (whence the common name Four o'Clock), remaining open until early the next day. The stems are woody below, but herbaceous above, forking repeatedly, with a disposition to support themselves lazily on convenient bushes.

This is a very common flower in Southern California, blooming on dry hillsides up to about 4,000 feet, from January until July. It is rather variable, and botanists have separated as varieties certain desert forms found east to Nevada.

Mr. W. L. Jepson, in his "Flora of California," records Wishbone Bush as a common name for this species.

M. Froebellii, Greene, bears bright rosy flowers, leaves sticky and hairy.

Sand Verbena (*Abronia villosa*, Wats.). Flowers pink to lilac, showy and rather fragrant, salver-shaped with a long tube, in many-flowered, long-peduncled heads, terminal or axillary on trailing, succulent sticky stems. Blooming in spring and early summer in sandy situations, sea-coast and desert, Southern California and eastward to Arizona and Utah. In March parts of the Colorado Desert are sheeted an almost solid pink with the abounding flowers of a larger-flowered variety of this plant, which botanists are disposed to call var. *aurita*. Somewhat similar is *A. umbellata*, Lam., common along the seashore from Southern California to Washington, distinguished by rose-purple flowers and prostrate stems sometimes 3 feet long. The common name Sand Verbena may be justified by the striking superficial resemblance of the flower heads to those of the true verbenas of the garden, although there is no real relationship.

There are about a dozen species of this beautiful genus indigenous to the Pacific Slope. A charmingly fragrant one is the Yellow Sand Verbena (*A. latifolia*, Esch.) found along the seashore from Monterey to Vancouver. In sandy meadows of the high Sierra Nevada, the handsome *A. alpina*, Brandegee, is found with white or pink flowers.

FIG MARIGOLD FAMILY

(*Ficoideæ*)

Smooth, succulent plants with opposite leaves, perennial. Petals and stamens very numerous inserted on the calyx.

Ice Plant (*Mesembryanthemum crystallìnum*, L.). Flowers about an inch in diameter, with a great many rose or white, linear petals; the stems and large wavy leaves thickly covered with a translucent, glistening incrustation resembling frost or ice, whence the common name. The plants grow in extensive, flat masses over the seaside mesas and in the pockets of cliffs of the Southern California Coast. Often the whole plant assumes a ruddy hue in droughty weather, and makes a noticeable color note in the landscape. It flowers in the spring.

The brown, unattractive seed vessels which abound upon old plants hold an unexpected pleasure for people with a taste for simple joys. If you break off a sprig of them, and lay it in a dish of water, the dry capsules will slowly open out into so many charming 5-pointed stars, discharging tiny black seeds. After drying out the process may be repeated with the same seed vessels for an indefinite number of times. In the language of science they are hygroscopic.

Fig Marigold (*Mesembryanthemum æquilaterale*, Haw.). Flowers red or pink, 1 to 2 inches in diameter, with very numerous linear petals surrounding a ring of countless stamens, which in turn enclose a cluster of several styles. A stout perennial with long trailing stems, bearing curious, fleshy, three-sided leaves 2 to 3 inches long, without petioles. Common along the California Coast from San Francisco to San Diego, often covering large areas with its matted stems and hanging over the faces of seaward-facing cliffs. It is found also on the Chilean Coast and in Australasia. In fact some botanists have thought that our plant is not native Californian at all, but imported.

The name Mesembryanthemum is at first sight such a staggering mouthful that timid people are afraid to try to pronounce it. If undertaken bravely and carefully, however, it will be found no whit harder than Chrysanthemum, which everybody carries off debonairly enough. As there are about 300 species in the world (mostly South African) the name is worth acquiring. The word means "Mid-day flower," because the blossoms open only in the sun. The pulpy fruit is edible, somewhat like a small fig (suggesting the common name), and folk who have been more fortunate than I in finding it in condition, say it is palatable.

PURSLANE FAMILY

(*Portulacaceæ*)

Low, fleshy herbs. Flowers opening only in the sunshine or bright daylight. Sepals fewer than the petals, which are usually 5. Stamens 3 to 20, opposite the petals when of the same number.

Red Maids (*Calandrínia caulescens*, var. *Menziesii*, Gray). Flowers crimson or magenta, in a loose, leafy raceme; plant a succulent-stemmed annual of spreading habit 6 inches to 2 feet long, with alternate narrow leaves an inch or two long. Blooming from January to April throughout California, in fields and on roadsides and hills, often making sheets of warm color over the ground.

This pretty spring flower is one of the children's favorites and besides going under the name of Red Maids is called Kisses, Mr. Jepson tells us. Among the Luiseño Indians of California the plant when young and tender was eaten as greens, and the pretty little seeds, black and shining like grains of gunpowder, roasted and ground were used for food.

There is a suspicion that the plant has worked its way in as an immigrant from farther south.

MINER'S LETTUCE (*Montia perfoliata*, Howell). Flowers small, white, in more or less interrupted racemes on stems a few inches to a foot high. These stems bear just below the flowers a pair of opposite leaves completely united at base into a roundish disk or saucer. The plant is an annual, with clustered root leaves more or less rhomboidal in outline, and having long petioles. Common in shady places throughout California, and as far north as British Columbia; blooming from February to July.

The succulence of the herbage of *Montia perfoliata* long ago attracted the Indians who ate it both raw and cooked as greens. From them the white pioneers took the hint, and in mountain districts it is still used to some extent. I can myself testify to its palatability when boiled and seasoned with salt and pepper. Its use by the aborigines has given rise to two common names, Squaw's Cabbage and Indian Lettuce. Under the name of Winter Purslane it has been introduced into English kitchen gardens as a potherb and salad. It has become naturalized in many parts of the world including Cuba.

Miner's Lettuce is closely related to the well-beloved Spring Beauty of the East (*Claytonia virginica*).

Pussy Paws (*Spráguea umbellata*, Torr.) Flowers pink or white, with conspicuous papery sepals, in cushionlike incurling clusters, umbellate, 1 to 3 inches across, topping fleshy scapes a few inches to a foot high. Leaves spatulate in a dense basal rosette. A mountain plant, common in gravelly open spaces, where it often dyes considerable spaces with a tone of delicate color during the months of summer. It is very common in the Yosemite region, but is well distributed in its various forms throughout the higher mountains of the Pacific Coast from Mount San Jacinto to British Columbia, eastward through Nevada to the Rockies including Yellowstone Park. Also in the northern Coast Ranges of California.

The soft, cushiony flower clusters, usually flesh tinted, are obviously responsible for the common name Pussy Paws of this charming little plant, familiar to every summer visitor to the higher mountains of California. As the color scheme of the clusters is quite often a mixture of white and pink, another popular name, Painted Snow Flower, is not without appropriateness,

Some modern botanists are disposed to call this plant *Calyptridium umbellatum*.

BITTER-ROOT (*Lewísia redivìva*, Pursh.). Flowers sometimes 2 inches across, varying from white to rose, with 12 to 15 petals about an inch long, opening out in sunshine like a wheel, and borne on a short one-flowered scape, jointed near the middle. Stamens very numerous. Leaves thick, linear, an inch or so long in a basal cluster. The whole plant sits quite close to the ground, and blooms in the spring; in the mountains, from Southern California (sparingly) to British Columbia, and eastward through Idaho, Montana, Nevada, Wyoming, Utah, and Arizona. Its fame in Montana has caused it to be adopted there as the State flower.

The large root of *Lewisia* is a conspicuous feature. This is exceedingly bitter if bitten into (whence the common name) but when properly cooked, as the Indians found out, is rich in starch and can be made palatable. The name *Lewisia* was given in honor of the leader of the famous Lewis and Clark exploring party of 1804 to the Pacific Coast. The plant has remarkable vitality, and the specimen upon which Pursh based his description is said to have been planted after lying for many months in a herbarium, after which it grew for a year before dying. This suggested the specific name *rediviva*, "that lives again."

PINK FAMILY

(*Caryophyllaceæ*)

Herbs, usually with swollen stem joints, simple opposite leaves, and regular perfect flowers; petals and sepals commonly five each; stamens 5 or 10; styles 2 to 5. Ovary superior.

INDIAN PINK (*Silène laciniata*, Cav.). Flowers brilliant red, the petals deeply slashed into four narrow divisions, and borne at the summit of stems usually a foot or two, but sometimes 5 feet high. Common in Southern California and in one of its forms eastward to New Mexico, blooming in late spring and summer on dry hills and amid chaparral. There is a stickiness about the stems and herbage that brings unsuspicious small insects to grief—a character common to all species of *Silene*, and suggesting the common name Catch-fly applied to many.

Quite similar to this Indian Pink of the South is *Silene californica*, Dur., also called Indian Pink, which occurs along roadsides and in open woods and cañons of Central and Northern California. The plant is generally smaller than *S. laciniata*, but the corolla is even more showy.

CROWFOOT FAMILY

(*Ranunculaceæ*)

Usually herbs (*Clematis* shrubby), with acrid juice, petals of indefinite number, or none, the calyx in that case colored like a corolla; stamens indefinite, generally many, pistils distinct. Leaves generally more or less divided or cut.

California Buttercup (*Ranúnculus californicus*, Benth.). Flowers shining yellow, $\frac{1}{2}$ to $\frac{3}{4}$ inch broad, with about 10 to 15 narrowish petals, topping branching stems a foot or more tall. Root leaves of three main divisions, each thrice (or more) again divided; leaves of the stem less cut. Widely distributed throughout California, northward to Oregon and Washington, blooming from February to June.

Ranúnculus californicus is the most likely to attract attention of about a score of species of the genus that are indigenous to the Pacific Coast, for it loves the open fields and roadsides, and woods-edges of the common way of life. Buttercup seeds were an important part of the Indian's wild harvest. They were parched in flat baskets by being tossed about with hot embers or pebbles, and then ground (generally with other seeds) into meal. The acridity of the seed disappears.

Red Columbine (*Aquilegia truncata*, F. & M.). The Columbines are easily recognized by their showy flowers with five petals, each produced downward in the form of a long, hollow spur, and sepals colored like the petals. There are more than a dozen species indigenous to the West, the nodding flowers occurring in red, yellow, blue, purple, and white in the different species.

Three or four are natives of the Pacific Coast and of these the most abundant is the Red Columbine. Its scarlet flowers tinged with yellow are a familiar sight during spring and summer, in moist, shady places and along mountain streams throughout the length and breadth of the state, from almost sea level to the edge of perpetual snow. Under favorable conditions the plant attains a height of four feet.

The Blue Columbine (*A. coerulea*, James), which is abundant in the Rocky Mountains and has the distinction of being Colorado's state flower, has been reported from the mountains of California also, but is not common there. It is a glorious flower, pale blue to white, occasionally tinged with yellow or pink, and bearing slender spurs sometimes two inches in length.

SCARLET LARKSPUR (*Delphinium cardinale*, Hook). The principal characteristic of the Larkspur flower is the backward prolongation of the upper sepal into a prominent spur. Both petals and sepals are colored alike.

The Scarlet Larkspur is one of the most striking of wild flowers and its magnificent racemes—1 to 2 feet long—of blazing red or orange-red blossoms on stems that frequently reach a height of six feet and sometimes more, are unmistakable among the shrubs and brush of the arid spaces where it delights to grow. It may be found in flower from May to August throughout Southern California, in the foothills up to about 3,000 feet, and along sandy washes. Blooming as it does considerably after the rains are over, the stems then are usually leafless, the foliage having withered up. Early in the season, the 5 to 7 narrow-fingered leaves are beautiful in themselves.

There is another red-flowered species (*D. nudicaule*, T. & G.) which is found in the Coast Ranges from the Santa Lucía Mountains north to Oregon. It is much less showy, the slender stems not more than two feet high, and the loose racemes few (2 to 12) flowered. Mr. Chesnut states that the root was reputed among some Indians to have narcotic properties useful to one, when gambling, to put an opponent to sleep!

Blue Larkspur (*Delphinium Parryi*, Gray). Blue Larkspurs are quite common on the Pacific Coast (about a dozen species, besides half as many more well defined varieties), found in open ground and shady, near the sea and on high mountains. The blue of the flowers is not always constant, often running into pink and white in the same species. Most of these species look pretty much alike to the non-technical, and as a matter of fact their strict determination is a difficult matter.

Delphinium Parryi is common in Southern California, affecting more or less open ground in the foothills from the sea to the edge of the deserts. Its blue spires of bloom are familiar sights from April until June.

The specific name is in honor of Dr. C. C. Parry, who was with the Mexican Boundary Survey of 1849, and who subsequently made extensive collections of Pacific Slope plants, especially in Southern California.

MONKSHOOD (*Aconitum columbianum*, Nutt.). The characteristic feature of the *Aconitum* flower is the one much enlarged sepal shaped noticeably like a hood or helmet, which all but extinguishes the much reduced petals. All five sepals are colored.

Aconitum columbianum is a handsome plant, 2 or 3 feet tall (or higher under favorable conditions), blooming in July or August; the robust flowers varying from a deep blue to white in a loose raceme, the palmate leaves about 5-parted. It affects moist meadows and stream banks in the higher mountains, the Sierra Nevada and Northern Coast Ranges of California, north to British Columbia, and eastward to Wyoming, Colorado, and Arizona. The specific name has reference to the Columbia River near the Washington-Oregon line, where Thomas Nuttall, the discoverer, collected his type specimens.

Our species is a true cousin of *Aconitum Napellus*, of the Old World, the plant from which the medicine Aconite is made, and is poisonous both in root and leaf. Sheepmen on the Pacific Slope know it by the prosaic name of Blue-weed, and have dread of it, as it has the reputation of poisoning sheep if they eat it.

Wild Clematis (*Clématis ligusticifólia*, Nutt.). A woody vine, clambering over rocks, shrubs, and trees. The creamy white blossoms in many-flowered panicles, are all sepals, which are colored like petals and are hardly more conspicuous than the feathery long-tailed seed-heads that succeed them. It blooms from May until July, and is widely distributed in California and Oregon, and eastward to New Mexico. Its preference is for the lower mountain regions, rarely getting above 4,000 feet elevation. The hard specific name means "with leaves like Ligusticum," an umbelliferous genus of which the potherb Scotch Lovage is a member. Besides the common name Wild Clematis, that of Virgin's Bower, the usual Old World name for a kindred species, is in use. In Northern California the plant is sometimes called Pepper Vine from the peppery taste of stem and leaves if chewed, as they sometimes are, for sore throat.

Similar in appearance and habit, and more showy, is the nearly related *Clematis lasiantha*, Nutt., common in the chaparral belts of Southern and Central California. The flowers of *C. lasiantha* although apparently bunched, are really solitary on long footstalks. The flowers of both are dioecious.

Wild Peony (*Pæonia Brownii,* Dougl.). This plant, a foot or so high, is sure to attract the attention of the observant long before blooming because of its pale, glaucous, rather fleshy, much divided leaves, mostly basal, that appear here and there upon the brushy hillsides in midwinter, from Southern California to Washington and east to Utah. The large solitary flowers, an inch or so in diameter, may be found from February until July (according to situation), and are a deep, sometimes almost black crimson, globular in form at first, but later expand into the shape of a cup with 5 or 6 concave, leather-like petals, backed by as many greenish-purple sepals. Stamens very numerous, clustered around 2 to 5 bottle-like pistils that eventually develop into conspicuous green pods, which serve to identify the plant long after flowering.

Early rains sometimes bring the flowers of the Wild Peony into bloom in late December, whence doubtless the name Christmas Rose, which it bears in some neighborhoods, although it is a true relative of the Christmas Rose of Europe and old fashioned American gardens—*Helléborus niger.*

BARBERRY FAMILY

(*Berberidaceæ*)

Shrubs or herbs, stamens as many as the petals and opposite them, anthers opening by two valves at the top.

Oregon Grape (*Bérberis Aquifolium*, Pursh.). Flowers yellow, in terminal clustered racemes; leaves odd-pinnate, bright glossy green with seven or more spiny-toothed leaflets resembling the holly (which suggest the specific name). The wood, particularly of the root, is bright yellow. Blossoms in the spring, the flowers succeeded in autumn by little bunches of pretty blue berries with a bloom resembling tiny wild grapes.

The Oregon Grape is a shrub 2 to 6 feet high, and is found often in great abundance in shady situations in both the Coast Ranges and Sierra Nevada of California north to Oregon and Washington. It is Oregon's state flower. Similar to it and indigenous from Northern California to Alaska, and eastward to Arizona, Utah, and Nevada, is the Creeping Barberry (*Berberis repens*, Lindley), rarely a foot high.

The Oregon Grape is grown in Eastern and European gardens under the name of *Mahonia*. The Indians made a decoction of the yellow root bark for the cure of stomach troubles.

INSIDE-OUT-FLOWER (*Vancouvèria parviflora*, Greene.). Flowers white or lavender, small, drooping, and numerous, with 6 to 9 petal-like bracts, in a loose panicle topping a wiry stem 1 to 2 feet tall. Sepals soon falling, white like the petals, but much larger, and abruptly recurved, exposing the inner floral organs in a way that suggests the quaint popular name that Miss Armstrong has recorded. Leaves radical, compound, twice or thrice ternate, the somewhat leathery leaflets about an inch across. The general effect of these graceful leaves is that of a robust maidenhair fern.

The Inside-out-flower blooms in late spring or early summer, in shady Coast Range woodlands from Central California northward to British Columbia. There are two other species, one, an Oregonian, with larger yellow flowers. The name Vancouveria preserves for flower lovers the name of that fine old sea rover, Captain George Vancouver, who visited the Pacific Coast in the early 1790's on his way around the world, and brought with him as botanist of his expedition the famous Scotch collector, Archibald Menzies.

CALYCANTHUS FAMILY

(*Calycanthaceæ*)

Aromatic shrubs with opposite entire leaves, sepals and petals similar and indefinite of number.

SWEET SHRUB (*Calycanthus occidentalis*, H. & A.). Flowers wine-colored, maroon, or sometimes white, 2 to 3 inches across, solitary, perennial on leafy branches; petals, sepals and stamens passing into each other so as to be practically indistinguishable from one another. A shrub 4 to 12 feet high, with harsh oval leaves 2 to 6 inches long; blooming throughout the summer and into the autumn usually along streams in mountain cañons from Central California northward. The foliage and flowers are fragrant when crushed, but not so much so as those of the related "shrub" or Carolina Allspice of the East. The flower holds its fragrance for a time even after wilting. The cup-like seed vessels, an inch or so long, remain on the bushes until the next year, and serve to identify the plant when out of flower.

This western Calycanthus also goes by the common names of Spice-bush and Wine-flower. Some Northern California Indians prized the pithy shoots highly for arrow shafts.

POPPY FAMILY

(*Papaveraceæ*)

Herbs (or rarely shrubs) with milky or colored juice, narcotic or acrid, and regular, perfect flowers, sepals falling as the petals open and thus often unobserved.

Prickly Poppy. Thistle-poppy (*Argemóne platýceras*, Link & O.). Flowers white, 3 or 4 inches across, with 4 to 6 crumpled petals, and a golden centre of very many yellow stamens, terminal on a stout, leafy, prickly stem, a foot or two high; leaves bluish green, prickly and thistle-like; blooming in spring and summer on dry hills, in sandy washes, and on the deserts, Central and Southern California eastward to Colorado and south to Mexico.

The Prickly Poppy is one of the most exquisite of Southwestern wild flowers, and is often mistaken by superficial observers for the Matilija Poppy, but a glance at the thistle-like leaves and bristling stems relieves all doubt as to the Prickly Poppy's identity. The Mexican name for it is Chicalote. Miss Armstrong records, also, the prosy but rather graphic Fried Eggs, suggested by the fully expanded flowers.

MATILIJA POPPY (*Rómneya Coulteri*, Harv.). Flowers white, 5 or 6 inches, or even more in diameter, with crêpe-like petals and a golden centre of numerous stamens, upon a bushy plant from 2 to 6 feet high (or under favorable conditions twice that); leaves smooth, rather glaucous, bluish-green, pinnately parted or divided. Blooming in late spring and summer.

Of all the Pacific Coast wild flowers, the Matilija Poppy is the most regal. It gets its name from the Cañon of the Matilija (pronounced *matil'ee-hah*) River of Ventura County, California, where its abundance once made it locally famous. While not a common plant, it is found in scattered localities over a considerable area in Southern California—as in Santa Barbara and Ventura Counties, the Santa Ana Mountains near Riverside, the Puente Hills near Los Angeles, and along the southern border of San Diego County, whence it extends well down into Lower California. It haunts stream borders in cañons and open, dry hillsides—a plant of catholic taste.

The botanical name was given, as to genus, in honor of a gifted Irish astronomer, Thomas Romney Robinson of Armagh Observatory, and as to species, to commemorate Dr. Thomas Coulter, the botanist who first collected it. It is one of the many California plants introduced into gardens.

FLAMING POPPY (*Meconopsis heterophylla*, Benth.). Flowers solitary, brick red deepening to the centre, from ½ to 2 inches in diameter, borne at the top of long, slender flower stalks; leaves pale green, somewhat succulent, pinnately parted. An herbaceous annual plant, 1 to 2 feet high, simple or branching, with orange-colored juice. Blooming in spring in more or less shady places and cañons of the foothills of Central and Southern California.

The Flaming Poppy is very variable, being much more showy in its northern range than in the south where the flowers are only conspicuous by their brilliancy of color, glowing like a spark of fire near the ground. The blossoms are exceedingly touchy, the delicate petals dropping almost as quickly as gathered and soon scattered by the wind—whence doubtless, another common name, Wind-poppy. Some botanists make a distinct variety of the southern form—var. *crassifolia*, Jepson—distinguished by thicker leaves and smaller flowers, sometimes popularly called Blood-drops. The genus is particularly abundant in Asia, being represented there by about 25 species mostly Himalayan, Tibetan, and Chinese.

TREE POPPY (*Dendromècon rígidum*, Benth.). Flowers a clear bright yellow, solitary, an inch or two in diameter, on a bushy, slender-branched shrub, 3 to 10 feet high with pale green, rather stiff, willow-like leaves—the bark whitish.

The Tree Poppy is found in California, seeming to prefer open, sunny hillsides, of the chaparral belt, though one may encounter it also in bottoms bordering the streams of cañons. It is most at home in the southern end of the state, and a well developed bush of it starred with its striking blooms of buttercup yellow is reward enough for a hard day's tramp. In my experience its best flowering season is from March until June, but as in the case of its more famous cousin, the Eschscholtzia, there is hope of collecting it during any month of the year. It is quite variable in its foliage characters and the size of its flowers—a fact that has led some latter-day species makers to fall upon it and split it up into about twenty recorded species. To the non-critical student, however, the one species, as here described, is well enough for practical purposes.

CREAM-CUPS. (*Platystèmon californicus*, Benth.). Flowers an inch or so across, of six cream-yellow petals and numerous stamens with broadly flattened filaments, sepals three; flowers borne on long, leafless flower-stalks arising from the axils of the hairy, narrow leaves, which are mostly opposite and 2 to 4 inches long.

This charming little flower of spring is at its height from March until May captivating young and old wherever it appears, which is in more or less sandy soil in fields, along roadsides, or on open hillsides, pretty much throughout California below 3,000 feet, and slipping across the border into Oregon and Arizona. The Cream-cup's blushing buds, dotted with tiny bristling hairs and drooping shyly on their slender stalks, are very appealing, and so much resemble the Poppy buds of our gardens, that the place of this wilding in the Poppy family is obvious. After flowering, the clustered necklace-like pods form an interesting feature, too, in the plant's life-history.

California Poppy (*Eschscholtzia californica*, Cham.). Flowers 2 to 3 inches across, deep orange or yellow, sometimes white, the plant a foot or so high with smooth glaucous leaves much and finely dissected, and a bitter juice. The most famous of all Pacific Coast wild flowers, abundant throughout California, and to some extent in Oregon and Washington. It may be found in bloom in every month of the year, but it is from February until June or July that its really rich display is staged. It occurs both as an annual and as a perennial, and is California's State flower.

The California Poppy was first made known to the world by Adalbert von Chamisso, poet and botanist, who was a member of the Kotzebue scientific expedition, which visited San Francisco Bay in October, 1816. This flower was then collected and given its rather formidable looking, though easily pronounced name in honor of Doctor Eschscholtz, another naturalist of the party. Spanish-Californians know it under various Spanish names, as *torosa*, *toronja*, and prettiest of all, *dormidera*, "the drowsy one," because its petals fold themselves to sleep at eventide.

FUMITORY FAMILY

(*Fumariaceæ*)

Delicate perennial herbs with compound, finely-dissected leaves and irregular, flattened, heart-s ped flowers, the 4 petals in 2 pairs, the outer, larger with spreading tips, and spurred or saccate at the base. Some botanists include the family with the *Papaveraceæ*.

Golden Ear Drops (*Dicentra chrysantha*, Hook & A.). Flowers yellow, $\frac{1}{2}$ to $\frac{3}{4}$ inch long, in loose, terminal panicles; stems and foliage pale and glaucous; the plant 2 to 5 feet tall, blooming from May to July on sunny chaparral-clad hillsides and in sandy washes of Central and Southern California. This is a rather stiff-looking plant, but its ferny leaves and alert, golden blossoms (obviously akin, because of their peculiar shape, to the Bleeding Heart, rather than to the Ear Drops of the gardens), make it a welcome sight to summer ramblers. The flowers, however, do not droop but sit erect in a most wide-awake fashion, their two outer petals spreading their ears out conspicuously as if hungry for all the gossip of their neighborhood.

BLEEDING HEART (*Dicentra formosa*, DC.). Flowers magenta or pink, or occasionally whitish, about $\frac{3}{4}$ inch long, nodding, in panicles terminating succulent stems a foot or two high. Leaves basal, pale green, compound, cut-lobed. Found in rich, damp woodlands of the Coast Range and low altitudes of the Sierra Nevada, from Central California (including the Yosemite region) northward to British Columbia, blooming in summer.

This charming flower is easy of recognition from its general resemblance to the other Bleeding Heart of old gardens, which is an Asiatic cousin known to botanists as *Dicentra spectabilis*. Our species, too, has been introduced into cultivation and is by no means averse to the "cakes and ale" of civilized life. In fact, of the 14 or 15 known species of Dicentras, natives of North America, western Asia, and the Himalayas, at least half a dozen have become more or less known as garden plants, especially in Europe, because of their striking beauty and ease of culture.

Latter-day botanists with a taste for upsetting established nomenclature discard the name *Dicentra* for their genus, and prefer *Bicuculla*, under which name students will have to look for it in some books.

MUSTARD FAMILY

(*Cruciferæ*)

One of the easiest of all plant families to recognize, because of the four distinct petals, generally clawed and forming a cross, their six stamens of which two are shorter than the others, and their usually peppery juice. The mature seed pods are often needed for determination of these plants.

Wild Mustard (*Brassica nigra*, Koch). Flowers yellow, $\frac{1}{4}$ to $\frac{1}{2}$ inch broad, in long, terminal racemes on stems 3 to 10 or 12 feet high; leaves dark green, the lower with one large terminal lobe and two to four smaller lateral lobes, the upper nearly or quite sessile, not so deeply lobed or even entire. Common everywhere below two thousand feet altitude; often making dense thickets, blooming February to May.

No plant makes more of an impress on the California landscape in the spring than this Wild Mustard, when acres upon acres of it in bloom blanket the valleys and mesas of the state. It is a naturalized immigrant, its presence on the Pacific Coast perhaps being due to the Franciscan Missionaries who were indefatigable introducers of European plants. It is one of the species from which the mustard of commerce is produced.

Wild Radish (*Ráphanus satìvus*, L.). Flowers purplish, pinkish or whitish with purple veins, about $\frac{3}{4}$ inch across, on erect and much branching stems 2 to 4 feet high. Basal and lower leaves deeply cut, with a large terminal lobe.

The Wild Radish is the common garden variety, escaped from conventionality and gone back to nature. It has done this so conscientiously, however, throughout the settled parts of California that its showy flowers are often an influential factor in the color scheme of the landscape and are sure to excite the attention of plant lovers whose knowlege of the radish has been limited to the ruddy roots that grace the dinner table. It flowers more or less every month in the year, though in most abundance in spring and early summer.

There is another species of Raphanus that is sometimes met with—*R. Raphanistrum*, L., or Jointed Charlock, an introduced annual with a general appearance of the Wild Radish, but the flowers are normally yellow and the long-beaked pods are so strongly constricted between the seeds as to give the seed vessel the appearance of a necklace.

PEPPER-ROOT. MILKMAIDS (*Dentaria californica*, Nutt.). Flowers white, often tinged with rose, in a loose raceme; stem 8 inches to a foot or two high, simple or branched; root leaves long-petioled, kidney-shaped, simple or with three roundish leaflets; stem leaves few, short-petioled, deeply lobed, the divisions lanceolate.

This plant is closely akin to the familiar Pepper-root (*D. laciniata*, Muhl.) of Eastern spring woodlands, but the flowers are larger. The whole plant possesses a wonderful charm and seems instinct with the very spirit of spring, as one comes upon it in its woodland retreats in the earliest year. It is frequent in damp, more or less shady places in the coast mountains and foothills of California, blooming from February until April.

The slender, fleshy rootstock of the Pepper-root bears a number of little tubers, which have a rather pleasant peppery taste, suggesting this common name for the plant. Toothwort, another popular appellation, is derived from the toothlike divisions of the rootstocks of some species, of which there are half a dozen or so indigenous to our Far West. The same characteristic is responsible for the scientific name *Dentaria*. Some botanists unite the genus with the closely related *Cardámine*.

Orange Wall-flower (*Erýsimum ásperum*, DC.). Flowers bright orange, occasionally yellow, fragrant, about ¾ inch in diameter, in showy racemes at first flat-topped, terminating stout, upright stems, 1 to 2 feet tall. Leaves lanceolate, more or less toothed and roughish. Blooms from February to May, or later.

The Orange Wall-flower (or Western Wall-flower, as it is often called) is one of the most noticeable of Pacific Coast flowers and is found in a variety of situations, in dry plains and sandy washes, in shady mountain cañons, and in the sunlit coniferous forests of the Sierra Nevada. The name Wall-flower seems, however, exceedingly inappropriate until we remember that the term is simply an inheritance from the Old World, where a nearly related plant is common on walls. Our plant has a wide distribution in this country, being found as far east as Texas, Arkansas, and Minnesota, southward to Mexico and northward to British America. It is quite variable in its minor characters and botanists have distinguished several varieties.

Another Wall-flower (*Erysimum grandiflorum*, Nutt.) with cream-colored or yellowish blossoms, is common along the seashore from Southern California to Oregon.

CAPER FAMILY

(*Capparidaceæ*)

Much like the Mustard Family, but the stamens, 6 or more, are all equal, and the seed pods frequently on long stalks. The European *Capparis spinosa*, whose buds furnish the capers of our dinner tables, is of this family.

BLADDERPOD (*Isómeris arbórea*, Nutt.). Flowers showy, dull yellow, with protruding stamens, borne in terminal, bracted racemes. Leaves thrice-divided, the divisions narrow.

The Bladderpod is a shrub from 3 to 10 feet high, with hard, yellow wood and an exceedingly characteristic, disagreeable smell in leaf and blossom—a sort of skunk among flowers, whose beauty is best enjoyed at long range. It is a Southern Californian and at home alike on the fog-drenched bluffs of the seashore and the arid sands of the desert. An interesting character of the Bladderpod is the feature that is responsible for the common name—the large, leathery, much inflated seed vessels, like fat pea pods which droop gracefully on long stalks and are very decorative.

STONECROP FAMILY

(Crassulaceæ)

Ours, fleshy perennial herbs, sepals, petals and pistils of the same number, stamens twice as many.

HEN-AND-CHICKENS (*Cotylèdon pulvèrulenta*, Benth & H.). Flowers reddish, corolla cylindrical from the upright habit of the five close-set petals, about ½ inch long, clustered at the top of a stout, rather leafy scape, a foot or more high, rising from a large, flattened rosette of succulent but thinnish leaves —the whole plant covered with a conspicuous white-mealy "bloom." Common in the chaparral belt of Southern California on rocky slopes. Blooms in summer.

There are several species of Cotyledon, but they are a critical genus and it requires careful analysis to determine them. The genus itself is readily enough recognized, however, and all species go indiscriminately with the non-professional, as Hen-and-chickens, from their habit of surrounding themselves with young off-sets which nestle in a circle close to the parent. The plants are often found in arid situations, and the succulent leaves make a grateful temporary substitute for water with thirsty travelers, whence the name, Hunter's Rock Leek.

SAXIFRAGE FAMILY

(*Saxifragaceæ*)

Shrubs and herbs, stamens and petals usually inserted on the calyx as in the Rose Family, but distinguished from this usually by the absence of stipules and fewer stamens (5 to 10), though in a few genera the stamens are very numerous.

SYRINGA (*Philadelphus Lewisii*, var. *californicus*, Gray). Flowers fragrant and showy, about an inch in diameter, white, of 4 or 5 petals, with a centre of conspicuous, very numerous yellow stamens, in terminal panicles. A shrub about the height of a man, sometimes twice that. Mountains of California, Oregon, and Washington.

The Syringa in bloom is one of the glorious sights of summer in the Yosemite region and other mid-altitudes of the Sierra Nevada, often forming thickets along streams. Its resemblance to the familiar Syringa of the gardens is marked and makes it of easy recognition. . .

There are four or five species and varieties of *Philadelphus* indigenous to the West, one being recognized as the Idaho state flower. The young, straight, pithy shoots of *Philadelphus Gordonianus*, Lindl., were used by the Indians for arrow shafts.

Wild Gooseberry (*Ribes speciosum*, Pursh). Flowers bright red, half an inch long or more, exclusive of the much exserted stamens, drooping in few-flowered racemes which fringe the spreading branches at short intervals; petals erect, shorter than the red, petal-like calyx lobes. Leaves rounded and slightly lobed, thickish, shining, dark green. An evergreen shrub 4 to 8 feet high, with leafy, reddish, bristly branches, armed with stout, triple spines at the leaf axils. Occurring abundantly in the foothills of Southern California and blooming from January to April.

From a botanical standpoint this is a true gooseberry; but the fruit is small, dry and exceedingly prickly, a very mockery of a berry. As a flowering plant, however, it is a glory, and the prospect of finding it in blossom is in itself a sufficient incentive to send one to the hills of a midwinter day. A bush in full bloom is a memorable sight, the abundant pendulous blossoms lining the stems for a space sometimes of several feet and seeming fairly to drip color. It does well in cultivation.

The general aspect of the drooping blossoms somewhat suggests a small Fuchsia, for which reason the popular name Fuchsia-flowered Gooseberry is also given to it.

YELLOW WILD CURRANT (*Ribes tenuiflorum*, Lindl.). Flowers bright yellow, both calyx and petals; in many-flowered, green, bracted racemes, rather closely scattered along the thornless branches: the calyx salver-shaped with spreading lobes, the short petals like a tiny crown in the midst. Leaves light green, small and thin, roundish, several lobed at the tip. A deciduous shrub, 3 to 10 feet high, flowering in late winter or early spring and bearing later a smooth, amber-colored berry. Occurring along cañon streams and in washes from Southern California, to Washington, and eastward to Montana, Colorado and New Mexico.

The massed bushes of the Yellow Wild Currant form one of the choice attractions in Flora's wild flower show of early spring. In its general effect the plant resembles the yellow-flowered form of the familiar Missouri or Buffalo Currant (*R. aureum* of the nurseryman) cultivated for ornament in old-fashioned gardens of the East; but its blossoms are less showy, and lack the spicy fragrance of the Missouri Currant.

There are on the Pacific coast several species of true Currants (readily distinguished from the Gooseberries which are of the same genus, by the absence of thorns and prickles), but the berries of all seem to be of negligible food value.

PINK WILD CURRANT (*Ribes glutinosum*, Benth.). Flowers rose to pale pink, or white above, the spreading-lobed calyx colored like a corolla, abundantly borne in many-flowered, long, drooping racemes that open gradually, the bloom thus continuing for a considerable period. Leaves alternate, 1 to 2 inches across, more or less wrinkled with 3 to 5 shallow lobes, glutinous particularly on the under side—the whole plant exhaling a strong, rather disagreeable odor; blooming in winter and early spring in the lower altitudes of the Coast Ranges of California, particularly to the southward.

The Pink Wild Currant is an erect much-branching shrub of compelling beauty when in bloom, from 4 to 12 feet high, and quite worthy of the place in flower gardens which is sometimes given it. The black, purplish berry, however, is a calamity, dry and bitter. The plant is quite variable and this and several closely allied forms described as *R. sanguineum*, *R. malvaceum*, etc., have caused botanists a lot of trouble to systematize. The root of one of these varieties used to have some vogue among the Luiseño Indians as a remedy for toothache.

Because of the characteristic odor exhaled by this bush it is sometimes called Incense Shrub.

WHIPPLEA (*Whipplea modesta*, Torr.). Flowers fragrant, small (hardly $\frac{1}{4}$ inch in diameter), white, becoming greenish, calyx and corolla 5-cleft and colored alike, borne in clusters at the end of the branches. A low trailing plant with opposite, 3-nerved leaves about an inch long and somewhat hairy, the stems slender and spreading. Blooming in March and April in the forests of the Coast Ranges of California from Monterey northward, particularly under redwood trees.

The name Whipplea preserves for us the memory of an accomplished military officer, Lieutenant Amiel W. Whipple, the commander of a Government Survey exploring, in 1853 and 1854, along the 35th parallel of latitude for a Pacific railway route. It was this expedition, particularly fortunate in its botanic finds, that brought to light this little wilding of the redwoods, whose unassuming charm seems to have appealed to Doctor Torrey when he gave it its specific designation *modesta*—"the modest." Whipple, promoted during the Civil War to a major-generalship, met his death at the battle of Chancellorsville in the flower of his manhood. His name is associated not only with this genus, but with several species, including the superb *Yucca Whipplei* of Southern California.

INDIAN RHUBARB (*Saxifraga peltata*, Torr.). Flowers about ½ inch across, rose color or whitish, disposed in ample panicles on fleshy, leafless scapes 1 to 3 feet tall; blooming in spring or early summer out of bare earth. It occurs on the rocky borders of rapidly flowing mountain streams, or even in the water itself, from the Yosemite region northward in California, at middle altitudes or in the foothills.

The feature of the Indian Rhubarb which is most likely to call attention to its presence, is the remarkable leaves. These do not develop until after the flowers, which, indeed, by reason of their early appearance, are often not seen at all by visitors in the mountain regions which the plant frequents. The leaves are all basal, from a foot to two feet in diameter, with numerous lobes and cuttings at the edge, and a cup-like cavity in the centre. They are borne on long stout leaf-stalks, and both these and the flower-stalk are edible—at least by Indians—a fact to which the common name Indian Rhubarb is attributable.

ALUM-ROOT (*Heùchera micrantha*, Dougl.). Flowers white, calyx bell-shaped, petals five, growing in a loose, feathery, narrow panicle ½ foot to 1½ feet long, topping a slender, naked stem a foot or more tall. Leaves long-petioled, hairy, heart-shaped at base, 1 to 4 inches long, more or less mottled and red-veined, all basal. Perennial, from a stout rootstock, blooming in summer on shady slopes and in the crevices of rock walls, in the Coast Ranges and the Sierra Nevada (Yosemite region), from Central California to British Columbia.

The genus *Heuchera*, of which there are some six or eight species more or less common in the West, was given this name by Linnæus in honor of an old-time German botanist Heucher. The species here described is probably the commonest on the Pacific Coast and is fairly representative of the generic appearance, there being a strong family resemblance among the different species. The root of the Heucheras has had some vogue in medicine, because of its pronounced astringency, whence the common name Alum-root, applied indiscriminately to them all. The plants take quite good-naturedly to domestication and gardeners find them desirable, particularly for rockeries and borders. The foliage is disposed to redden with age and is then exceedingly ornamental.

ROSE FAMILY

(*Rosaceæ*)

Herbs, shrubs or trees with alternate leaves, simple or compound, and usually stipules. Stamens generally numerous: these and the petals inserted on the calyx.

ISLAY. WILD CHERRY (*Prunus ilicifolia*, Walp.). Flowers white, in rather dense axillary racemes 1 to 3 inches long. Leaves glossy, leathery and spiny-toothed, suggesting the holly foliage. An evergreen shrub or small tree, blooming in May or June, in the chaparral belt and cañons of the mountains. Central and Southern California, and western Arizona.

The cherry part of *Prunus ilicifolia* is a surprise. It ripens in the autumn and is a dark red drupe, half an inch or so in diameter, that looks very tempting, but proves to be almost all stone. The thin covering of pulp, however, is really very palatable and sweet when thoroughly mature. The Indians, whose patient observation and experimentation got good out of many an unpromising subject, found the stones of great value. Breaking them open, the large kernels were crushed in mortars, leached of their bitterness and boiled. The result was a nutritious mush. Islay is pronounced *is-lah'-ee* .

THIMBLE-BERRY (*Rubus nutkánus.* Moc.). Flowers white, or tinged with pink, 1 to 2 inches in diameter, in few-flowered terminal clusters on long stems. Leaves, suggesting the maple, palmate, 5-lobed, 3 to 12 inches across, long-petioled and horizontally spreading. A bush from 2 to 8 feet high, the erect or trailing stems without thorns, blooming in late spring or early summer, from Central California (including the Yosemite region) in mountain woods northward through Oregon and Washington to Alaska, and eastward through Utah and Colorado to Michigan, with a fondness for stream borders.

The fruit of the Thimble-berry is red when ripe, looking like a depressed raspberry, as indeed it is, and variable as to edibility. In localities of little rainfall it tends to dryness, seeds and insipidity; but in the damper regions of the northern coast, it becomes fleshy and luscious. In its eastern range it is sometimes known as Salmon-berry, a name more properly applied to a kindred species with yellowish fruit.

Some botanists discard Mocino's name *Rubus nutkanus* (referring to Nootka, a locality of British Columbia) and prefer Nuttall's name for this species—*R. parviflorus.*

CHAMISE. GREASEWOOD (*Adenóstoma fasciculatum*, Hook & A.). Flowers white, individually very small, but disposed in showy, crowded panicles, several inches in height terminal on the branches. Leaves evergreen, needle-like, about $\frac{1}{4}$ inch long, and clustered along the branches. A shrub 2 to 15 feet high, flowering from April to June, and clothing great areas of mountain sides in California with a dense, uniform, dark green covering in effect like heather in the Old World; particularly abundant southward and near the Coast. After flowering, the abundant reddish-brown seed vessels give a decided color note to the mountain slopes.

Greasewood is a term given in the Southwest to so many different plants that it is almost meaningless. It is applied to this Adenostoma doubtless because the roots have long been a recognized fuel in Southern California, and when thoroughly dry, burn as though they contained grease indeed. Chamise (pronounced *cha-meeze*) is an Americanized form of the Spanish *chamiso*.

In the extreme south a nearly related species is met, *Adenostoma sparsifolium*, Torr., distinguished by scattered leaves and a red, cedar-like bark that hangs in shreds. It is known in popular parlance as Red Shank or Bastard Cedar.

California Holly (*Heteromèles arbutifolia*, Roemer). Flowers white, small, borne in dense terminal panicles. Leaves evergreen, leathery, rigid and rather glossy; 2 to 4 inches long, oblong and more or less saw-toothed. A shrub or small tree from 6 to 25 feet high, blooming from May until August, according to locality, common in the chaparral belt of the Coast Ranges of California.

Better known than the flowers of the California Holly are its cheerful red berries, which abundantly adorn the little trees in late autumn, and are extensively used for Christmas decoration on the Pacific Coast. The common name is not happy, for the plant is not at all related to the true holly. The English, who have cultivated it to some extent in their gardens. are more accurate in calling it California May-bush, the May-bush or May being the English hawthorn which is of the same family with our plant. Christmas-berry is another popular name, and Spanish Californians, who found some use for the berries as the basis of a drink, called it *toyòn*, The Indians made a regular article of diet of the berries, toasting them first over hot coals, or boiling them.

California Wild Rose (*Rosa californica*, Cham. & S.). Flowers pink, fragrant, 1 to 2 inches in diameter, in few to many-flowered corymbs, or solitary. Bushes 3 to 10 feet high, found from Lower California to Oregon, flowering practically throughout the year at the lower altitudes.

Of the half dozen or so species of Pacific Coast wild roses *R. californica* is the most common, often forming dense thickets along roadsides, in moist meadows, or upon the banks of streams. No California wild flower gave greater pleasure to the pioneering Spaniards of a century and a half ago. The diaries of the early Franciscan missionaries contain many references to it, always with enthusiasm and affection; for it reminded those homesick wanderers of their own sweet roses of Spain. And so they called this wilding of the West the rose of Castile. Even to the present day this name (in its Spanish form *Rosa Castilla*) continues in use in the remoter mountain districts of Southern California—a pleasant link with that early day when Spain was conducting the humane experiment of reducing a race by religion instead of arms.

A kindred species known as the Redwood Rose (*R. gymnocarpa*, Nutt.) will sometimes be found in shady woods of the Coast Ranges. It is of smaller, daintier habit.

MOUNTAIN MAHOGANY (*Cercocarpus betuloides*, Nutt.). This is a shrub or small tree, under best conditions 20 feet or so high, but sometimes only 2 or 3 feet, distinguished by its small, wedge-shaped leaves, distinctly veined, and small solitary or clustered, apetalous, whitish flowers, each resembling a little cup full of stamens. After flowering the seed vessel develops in early summer a conspicuous, feathery, curling tail, two or three inches long, enclosed in a tubular case—a characteristic feature of the plant. Blooming in March or April, and common in the chaparral belt of the mountains from Southern California nearly to the Oregon line.

Botanists make numerous species of Mountain Mahogany, and, while the botanical distinctions are in many cases difficult to fix, there is a sufficient general similarity among all to make the genus of easy recognition. The wood is remarkable for its extreme hardness, a character to which the common name is owing. Out of it, in default of iron, the Indians made many of their implements, such as digging sticks for grubbing up edible bulbs, mescal sticks for cutting out the buds of the agave, fish-spears, arrow-tips, and so on.

The feathery tailed seeds when mature are loose in their tubes, and are easily lifted by the wind and scattered.

MOUNTAIN MISERY (*Chamæbatia foliolosa*, Benth.). Flowers white, ½ inch or so across, with five petals and a centre of numerous stamens, the whole resembling a strawberry blossom, in few-flowered terminal clusters. Leaves 1 to 3 inches long, finely dissected, fern-like and very sticky, resinous and of a balsamic odor. A spreading, much-branched shrub, 1 to 2 feet high, blooming from May to July and common in the Sierra Nevada woods of Central California. It is noticeably abundant in the Yosemite region, and carpets considerable areas in the open coniferous forests.

The common name Mountain Misery is not without appropriateness, when one comes to know the plant intimately. The gummy secretion which thickly covers stems and foliage comes off at a touch, and after a tramp through a patch of the plant one's clothing and shoes become hopelessly smeared with it. So does the wool of sheep that comes in contact with it, and the bells of cows set adrift in the woods to browse may get so deadened in sound by resinous coating from the plant as to be quite useless for betraying the animals' whereabouts. Better regard *Chamæbatia* (pronounced *kam'e-bá-shia*) at a discreet distance. Tarweed and Bear's Clover are other local names.

PEA FAMILY

(*Leguminosæ*)

Herbs, shrubs, or trees, with alternate, usually compound leaves with stipules, and flowers often papilionaceous, that is, with one petal (called the banner or standard) conspicuously larger than the others and turned backward or spreading. Stamens usually ten, sometimes united below into a tube about the pistil; sometimes nine so united and one distinct; sometimes all distinct. Fruit a legume, that is, like a pea-pod.

LUPINE (*Lupìnus Stivérsii*, Kellogg). Flowers with a yellow banner fading to salmon, and rose-pink lateral petals, disposed in a terminal raceme; leaves compound, with several narrow finger-like leaflets radiating from a common centre; plant, annual, 6 inches to $1\frac{1}{2}$ feet high.

This strikingly handsome flower, blooming in summer, is one of the noticeable wildings of the Yosemite Valley and the Sierra Nevada of Central California. It is also reported from a few places in the Coast Ranges, but seems to be nowhere abundant. A species with all the petals yellow (*L. citrinus*, Kellogg) sometimes is found in the same range.

YELLOW LUPINE (*Lupinus arboreus*, Sims). Flowers fragrant, yellow, in long racemes; leaves compound with finger-like leaflets radiating from a common centre. A stout, shrubby plant 4 to 10 feet high, blooming in spring and common in the sands bordering on the sea from Central California southward.

The Yellow Lupine has played an important part in holding shifting sands along the Coast, the huge roots, sometimes 20 feet in length, being natural sand binders. This quality was turned to particular service a number of years ago at San Francisco where a considerable area of bare sand-lots, which had been continually blown about by the strong ocean winds from time immemorial, were efficiently stabilized in a year by the systematic planting of this Yellow Lupine.

Besides *Lupinus arboreus* there are five or six other yellow-flowered species indigenous to California. One of these, *L. luteolus*, Kellogg, 3 to 5 feet high, has proved to be a serious pest in some interior valleys of Northern California, from its habit of monopolizing the ground. It is locally known as Butter-weed from the color of the flowers.

CAÑON LUPINE (*Lupinus cytisoides*, Ag.). Flowers very showy, dark pink to magenta, sometimes blue or white, in dense terminal racemes a foot or so in length; leaves divided into 7 to 10 fingers 2 inches or more long; stems marked with longitudinal stripes and minutely hairy. A stout, herbaceous perennial, 3 to 6 feet high, blooming April to August, mountains of Southern California, north to Oregon.

The Cañon Lupine, as its name indicates, is particularly at home in mountain cañons, where it often covers considerable areas on the damp banks and moist flats, especially along streams. It is a magnificent plant at its best, and the mild glow of its flowers in the veiled light of the more or less shaded situations it loves, makes an effect not soon forgotten.

Of about 70 species of lupine indigenous to the United States, most are found wild only on the Pacific Slope. In spite of the abundance of the genus and its membership in a family that makes such valuable contribution to man's food needs as the pea, bean, and lentil, our lupines seem to have played little, if any, part in the service of man—even aboriginal man—beyond the occasional use of the young plants of some species as greens. They were eaten either boiled or roasted.

DEERWEED (*Hosackia glabra*, Torr.). Flowers yellow turning reddish, $\frac{1}{4}$ inch long or so, in numerous close-set umbels on slender, leafy branches, more or less woody and spreading. Leaves small, of usually 3 leaflets. Seed-vessel a slender, somewhat curved, pod, an inch or two long, with a long point.

The Deerweed is a somewhat woody perennial from 2 to 6 feet high, common throughout California below about 3,000 feet, particularly on dry hillsides and mesas. It may be found in bloom at all seasons (at least in the South), often giving a distinct coloring to the foothill slopes. It is a valuable bee-plant, known to beemen as Wild Alfalfa.

There are some 40 species of Hosackia indigenous to the Western United States. Some botanists throw them all into Lotus, so that our plant will be found mentioned as *Lotus glaber*. This is unfortunate for the name Hosackia commemorates one who should not be forgotten—a certain Dr. David Hosack, who was professor of botany at Columbia College something more than a century ago. His botanic garden in what is now the heart of New York City was one of the first to be established in America. The famous botanist Pursh once worked there as gardener; and John Torrey, one of America's most celebrated botanists, was a student of Hosack's.

Bur Clover (*Medicàgo denticulata*, Willd.). Flowers very small, bright yellow like specks of gold, 2 or 3 together on an axillary footstalk, rising out of clover-like leaves with slashed stipules, and succeeded by curious little pods coiled twice and armed with hooked prickles. Blooming from January to June, and common everywhere.

The Bur Clover is an Old World plant of some forage value—a native of the Mediterranean region, which has become introduced on the Pacific Coast, though nobody knows just when or how. Possibly the seeds, which, being prickly, cling very persistently to any likely hold, stole into California on the woolly back of sheep which the Missionary Fathers had brought over from Spain. The plant withers away with the coming of the dry season, and then the ground will be strewn with the brown mature seed vessels, which are exceedingly nutritious and eagerly eaten by sheep and cattle.

Sometimes also found wild in California is the similar *Medicago lupulina*, L., the Black Medick of the Old World, but its more numerous flowers are in stout spikes, and its pods, which are black when ripe and kidney-shaped, are without prickles.

RATTLEWEED. LOCOWEED (*Astrágalus leucopsis*, Torr.). Of the 1,000 species of Astragalus in the world, 35 or 40 occur on the Pacific Coast. They are mostly perennial herbs with odd pinnate leaves, the leaflets very numerous. The usually small, narrow flowers are borne chiefly in spikes or racemes on long peduncles, arising from the axils of the leaves. The seed-pods are often noticeably inflated like bladders.

Astragalus leucopsis bears pods of this sort, and is further distinguished by greenish-white flowers, and pale leaves with 10 to 15 pairs of oval or oblong leaflets each ½ inch long or so. It blooms from March till May, and is very common in Southern California in the unbroken soil of mesas and plains.

The term Locoweed, applied to this species and many others, is given because animals that feed on the herbage have a tendency to become insane or *loco* in Spanish parlance. Doctor Hall, in his valuable handbook "A Yosemite Flora," states that the deleterious effect has been found to be due not to the plant itself but to the presence of the metal barium, which the plant gathers from the soil. This varies in different localities; hence the wide difference of opinion as to the danger from locoweeds.

BEACH BLUE LUPINE. CHAMISSO'S LUPINE (*Lupinus Chamissonis*, Esch.). Flowers blue or sometimes violet or white, the banner with a yellow spot, somewhat whorled in rather compact racemes; leaves with 7 to 9 leaflets, very silky on both sides, giving the plant a silvery green aspect.

Chamisso's Lupine is a somewhat shrubby plant, $1\frac{1}{2}$ to 3 feet high, growing usually in clumps, and is of frequent occurrence on the sand dunes of the sea beach from Southern California to Oregon. Its showy flowers may be found in blossom almost every month of the year. The species is quite variable, and particular botanists are accordingly tempted to split it up into several species, but the points of distinction are difficult to define with certainty.

The specific name of this plant is commemorative of the poet-botanist Adelbert von Chamisso, and was bestowed by Chamisso's fellow naturalist of the Kotzebue exploring expedition, Johann Friedrich Eschscholz. These botanists collected in 1816 in the vicinity of San Francisco Bay, and it was there that Chamisso discovered the California Poppy, naming it in honor of Eschscholz. The latter's dedication of this beautiful lupine to his comrade is a pleasant instance of friendly tit-for-tat.

PRIDE OF CALIFORNIA (*Láthyrus splendens*, Kellogg). Flowers showy, deep crimson, a couple of inches long or more, the banner (which is an inch or so long) leaning back upon the flower stalk; several in a pendent cluster. Leaves with 8 or 10 small scattered leaflets, and bearing tendrils 2 to 5 parted.

This superb flower (a Pacific Coast cousin of the garden sweet pea) is borne upon a vine that may attain a length of 8 or 10 feet, and is found climbing over shrubs on dry hillsides in parts of Riverside and San Diego counties of California and southwest into Lower California, blooming in the spring, the plant dying down in summer. It has been introduced into cultivation to some extent.

A much commoner, but far less beautiful Lathyrus, is *L. vestitus*, Nutt., commonly known as Wild Pea, and found climbing about the chaparral of the foothills from the San Francisco region south to Lower California. The leaves (tendril bearing) have 5 or 6 pairs of leaflets, $\frac{1}{2}$ to 1 inch long, and the flowers, blooming from February until May, are violet, rose, or nearly white.

WILD CLOVER (*Trifolium tridentatum*, Lindl.). There are some 30 species and varieties of native clovers indigenous to the Pacific Coast, not always obvious as clovers to those people whose observations have been limited to the common white and red clovers of Eastern fields and roadsides. All, however, are low herbs, distinguished by compound leaves with adhering stipules and 3 leaflets which are usually toothed, and small flowers, purple, red, yellowish or white, in close heads or umbels on axillary or terminal peduncles.

T. tridentatum is a very common and characteristic species in Central and Southern California, blooming in the spring and early summer on plains and grassy slopes of the foothills. The flowers are pink-purple with a darker centre and sometimes with a whitish tip to the banner, disposed in a broad, flattish head, an inch or so across on footstalks 1 to 2 inches long. This species, together with many others, used to form a very important item in the bill of fare of the California Indians. They ate the tender leaves before flowering both raw and cooked; and with some tribes the appearance of the clover in spring was the occasion of special ceremonial dances. The seeds of a few species were also used for food.

MESQUIT (*Prosòpis juliflora*, DC.). A shrub or small tree, attaining a height of 15 or 20 feet, with widely spreading, spiny branches, and forked leaf-stems bearing numerous pairs of narrow leaflets, which are deciduous in winter. The small yellowish flowers are borne in spring in conspicuous, dense, cylindrical narrow spikes, 4 or 5 inches long.

The Mesquit under several varietal names is found abundantly in the Colorado Desert of Southern California (and occasionally farther west in sandy washes and on dry mesas of the Coast country), eastward to Utah, Colorado, and Texas, and southward to Mexico, presenting, however, several varieties. The flat seed pods, 4 to 6 inches long, contain numerous small beans, which were an important food supply of the desert Indians. Indeed the tree has played many parts in aboriginal life. From the sweetish pulp of the pods a sort of confection was made; the wood, exceedingly hard and heavy, was used in building; a black dye was obtained from the sap; a mucilaginous drink for sore throat was made from the clear gum that exudes from wounded limbs; and the twigs were used in making coarse baskets. The wood is an important fuel in the Southwest. The blossoms are rare pasture for bees, and the best Mesquit honey is almost unrivaled in excellence.

DALEA (*Dàlea californica*, Wats.). The genus Dalea is an important one in the Far West, comprising both herbs and shrubs, with odd-pinnate leaves usually abundantly sprinkled with resinous dots, and small pea-like blossoms borne in terminal, often showy, clusters and spikes.

Dalea californica is a low, pale-barked shrub of the Colorado Desert of California, and in March or early April the bushes, which are two or three feet high, are a glory of rich indigo color from the loose clusters of expanded blossoms. In similar situations is the closely related *Dalea Schottii*, Torr., with equally beautiful dark blue flowers, but there is a marked difference in the foliage. In *D. californica* the leaves are pinnate with a few pairs of leaflets that are gray with fine hairs, while the leaves of *D. Schottii* are simple, so narrow as to be almost needle-like, and with little or no hairiness.

The most magnificent of the Pacific Coast daleas is a small tree, *D. spinosa*, Gray, practically leafless, which grows in the same desert and eastward to Arizona. It blooms in June, when few travelers care to brave the desert heat, but the splendor of this little tree, in its dress of deep indigo blue, is a sight that will repay much hardship. It goes by the name of Indigo-bush and Smoke-tree.

GERANIUM FAMILY

(Geraniaceæ)

Herbs with lobed or compound leaves, and perfect regular flowers, sepals and petals usually 5 each; stamens as many or twice as many. Seed vessels 5, at first united about a persistent central column, finally splitting upward from below and slinging out the seeds.

Wood Sorrel (*Oxalis oregana*, Nutt.). Flowers about an inch long, white or rose, frequently dark-veined, borne singly on rather short 2-bracted scapes; leaves cloverlike, of 3 leaflets heart-shaped at the outer edge, 1 to 2 inches broad, usually rusty underneath, rising from slender creeping rootstocks.

The Wood Sorrel is common in the redwood forests of the Pacific Coast from the Monterey Bay region northward to Washington, often making solid mats of mingled leaf and flower over the ground. The leaves, if bitten, are pleasantly acid, like those of the eastern wood sorrel.

FILAREE (*Erodium cicutarium*, L'Her.). Flowers magenta, about $\frac{1}{4}$ inch across in few-flowered umbels topping slender footstalks that rise from a rosette of pinnate leaves 6 inches long or so, with many deeply cut leaflets. Blooming from January to June in valleys and on the foothills throughout California and eastward to the Rocky Mountains.

Filaree is one of the most valued of Far Western forage plants, and carpets the ground in places like turf. It is believed by most botanists to be an introduction from the Old World, where it is a common weed, but if so it was an early immigrant; for 70 years ago, when California was still very wild, Fremont reported it in abundance in the northern part of the state. The queer common name is an American corruption of the Spanish *alfilerilla* (pronounced in California *alfileree' ya*) meaning little pin; from the resemblance of the long-beaked seed vessels to that useful article. When dry these long beaks separate into 5 slender divisions which are the styles, and, subtended by the brown seeds, twist about in a way entertaining to the childlike mind of all ages, suggesting the hands of a clock on its travels, particularly when the seed is set on end upon one's clothing; whence another common name, "Clocks."

MEADOW FOAM (*Floerkea Douglasii*, Baillon). Flowers showy, an inch or more across, yellowish fading to white at the tips or sometimes rosy, bell-shaped, conspicuously veined, solitary on naked footstalks rising from the axils of the much dissected leaves. Blooming in the spring throughout much of California, and north into Oregon.

This charming annual, 6 or 8 inches high, one of many Pacific Coast flowers introduced into Old World gardens three quarters of a century ago, is a conspicuous feature of wet meadows, particularly of Central California, and the effect of its masses of creamy flowers rippling amidst the green is quite appropriately suggested by the common name. The name Floerkea commemorates a forgotten German botanist, H. G. Floerke, who lived in the early part of the 19th century. All botanists, however, do not agree that our plant is truly a Floerkea, and some of them put it in the closely related genus Limnanthes, and indeed into a separate family which they call *Limnanthaceæ*. Among florists the flower is usually referred to as *Limnanthes Douglasii*, R. Brown.

CALTROP FAMILY

(*Zygophyllaceæ*)

A family of herbs, shrubs, and trees, of wide distribution in the tropics and warmer parts of the world, sparingly represented on our Pacific Coast by three or four genera.

Creosote Bush (*Larrea Mexicana*, Moric). Flowers solitary, yellow, about ½ inch across, the five distinct petals disposed to turn edgewise to the light. Leaves evergreen, of two rather thick, curving, pointed leaflets, shining with a resinous sort of varnish that exhales a peculiar smell, especially upon burning, suggesting creosote, whence the common name of the plant. It is a shrub from 3 to 10 feet high, with many grayish stems which are banded in black and is very common in the desert regions of Southern California and Arizona and southward into Mexico, blooming off and on throughout the year. Quite as noticeable as the flowers are the little round seed vessels densely clothed with white silky hairs.

The Creosote Bush has a medicinal reputation with the Indians and Mexicans, with whom it goes by the Spanish names *hedeondilla* and *gobernadora*. A tonic tea is made of the foliage and for saddle sores on animals a poultice of the leaves.

SPURGE FAMILY

(*Euphorbiaceæ*)

Herbs with milky juice, often poisonous; flowers of different sexes on the same or different plants.

GOLONDRINA. RATTLESNAKE WEED (*Euphorbia albomarginata*, T. & G.). Flowers inconspicuous, in a cup-shaped involucre having the appearance of a calyx, the numerous male flowers consisting each of a single stamen, and the solitary female of a 3-celled ovary elevated and pendent upon a long footstalk; involucre 4 to 5-lobed, with alternating maroon-colored glands, margined with white or rosy appendages that resemble petals. Leaves small and roundish, heart-shaped at base, with a thin whitish edge. A low or prostrate, many-stemmed little plant forming round mats upon the dry ground in the Southern California foothills and mountains, very common, and blooming from April on through the summer.

There are several species of Euphorbia, more or less alike in general appearance, that go under the name of Rattlesnake Weed, or, among Spanish-speaking folk, Golondrina. They have a considerable repute as antidotes for rattlesnake bites. The leaves are pounded and bound wet on the wound.

CASTOR OIL PLANT (*Ricinus communis*, L.). Flowers small without petals, greenish, of two sexes, in showy terminal racemes, the female flowers above the staminate. Leaves from 6 inches to a foot or more broad, divided into 6 to 11 finger-like toothed lobes. Seed vessels ½ inch or so in diameter, usually spiny, splitting when mature and discharging the smooth, shiny seeds which are black, mottled with white or brown. A stout, herbaceous plant, from 3 to 15 feet high, which, in places where there is little frost, becomes woody and treelike. The immature fruit is conspicuously rosy red.

This is the plant from whose seeds the famous medicine Castor Oil is produced. It is native to Asia and Africa, but having a pronounced taste for travelling, it is now found at home in most of the warmer parts of the earth. It is not known surely how it reached California, but perhaps the Franciscan Missionaries who imported the seeds of so many of the Old World's useful plants introduced this one also, for its medicinal value. At any rate, it is now well established as a wild plant in many parts of the state, and makes indeed an ornamental sight. Mexicans call it "higuerilla," little fig tree, probably from the form of the leaf. From the latter also is derived a common Old World name, Palma Christi, the hand of Christ.

SUMAC FAMILY

(*Anacardiaceæ*)

Shrubs or trees, with resinous or milky juice, and usually alternate leaves. Flowers small and mainly regular.

LEMONADE BERRY (*Rhus integrifolia*, B. & H.). Flowers small, pink or white, in dense terminal clusters 1 to 2 inches long, sterile and fertile flowers often mixed together. Leaves evergreen, thick, leathery, generally entire, an inch or two long. A stout shrub 3 to 6 feet high, blooming from February to May, on seashore bluffs and to some extent on the foothills farther inland, from Santa Barbara to Lower California.

The conspicuous fruit of the Lemonade Berry is responsible for the common name. It is a flat, reddish drupe or berry, something less than ½ inch across, very sticky and sour. It is very abundant on the bushes in summer, and if soaked for a few minutes in water communicates its acidity to the liquid making a very pleasant drink, well known to Indians and Mexicans. The wood of the plant is hard and red within, whence the name "Mahogany" sometimes given it.

A closely related species is *R. ovata*, Wats., whose range is more inland than *R. integrifolia*. The fruit is rather smaller.

SUMAC. MANGLA (*Rhus laurìna*, Nutt.). Flowers very small, white, in showy terminal panicles; leaves thin but leathery, entire, 3 to 4 inches long on rather long petioles. Seed vessels very small, white and wax-coated. An erect, evergreen shrub, 6 to 15 feet high, with a fragrance of bitter almonds; blooming from June to August and very common in the valleys, foothills, and chaparral belt of Southern California.

It is always a surprise to the Easterner to be told that this handsome, rather stately shrub with its simple laurel-like leaves is a sumac, for the sumacs of the Atlantic slope are quite different looking because of their pinnate foliage. Yet the Pacific Coast plant is a true cousin of those.

The wood of both *Rhus laurina* and *R. integrifolia*, is hard and red-hearted, and the larger specimens are often cut up into posts for stringing wire fences upon. Spanish-speaking Californians call both species Mangla, perhaps because of the sticky resinous juice—the Spanish word strictly meaning the gum that exudes from the European Rockrose.

Squaw Bush (*Rhus trilobata*, Nutt.). Flowers greenish yellow in short, spike-like clusters, appearing from February until April before the leaves. Leaves compound with 3 leaflets toothed or divided, and narrowed to the base. A low shrub, 2 to 5 feet high, whose foliage and numerous, long, spreading branches are quite aromatic; common in the foothills and open, sunny spots throughout California, and eastward to Dakota and Texas.

The appearance of *Rhus trilobata* remotely suggests its venomous cousin the Poison Oak, but it has none of the bad qualities of the latter—indeed is a very much, esteemed and useful plant among the Indians, as its name Squaw Bush implies. The Indian women of Southern California have long made use of the split stems for wrapping the coils of their basket material. The fruit also—red, sticky berries—have the same acid quality as those of *Rhus integrifolia*, and make a refreshing drink when steeped in water. It was also customary in old times to dry these berries, and grind them for use as food. Mr. Chesnut records that a lotion prepared of the dry, powdered berries was once used by the Indians of Northern California as a smallpox remedy.

MAPLE FAMILY

(*Sapindaceæ*)

Trees and shrubs with deciduous leaves, compound or simple, without stipules. Some botanists separate this family into 3 distinct ones, of which the Maple, the Buckeye, and the Soapberry are respective types.

California Buckeye (*Aèsculus californica*, Nutt.). Flowers showy, irregular, white, yellowish or rosy in dense panicles, 6 inches to a foot long. Leaves long-petioled, opposite, palmate with 5 or more leaflets. A shrub or more commonly a low, spreading tree, from 10 to 20 feet high, occasionally higher. Blooming in May or June.

The California Buckeye is a common sight along stream borders and cañon sides of the foothills and lower slopes of the Coast Ranges as well as the Sierra foothills, from the northern edge of Los Angeles County to the upper Sacramento Valley. It is most apt to attract attention under two very different aspects—in the spring when it is in the glory of its bloom, and in the autumn when its bare branches are hung with the odd pear-like seed vessels. The fresh seeds are poisonous, but rendered edible by roasting and leaching.

BUCKTHORN FAMILY

(*Rhamnaceæ*)

Shrubs or small trees, with simple leaves and small flowers. Petals, calyx lobes, and stamens 4 or 5 each; the stamens opposite the petals.

CASCARA SAGRADA (*Rhamnus californica*, Esch.). Flowers small, greenish white, in umbel-like clusters. Leaves evergreen, alternate, thin-leathery, elliptic oblong entire or minutely toothed, 1 to 3 inches long. A shrub or small tree from 4 to 15 or 20 feet high, common throughout California, blooming from February to April; the flowers succeeded in the autumn by dark crimson or black berries, $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter.

Cáscara sagráda is Spanish for "sacred bark," and was so termed by the Spanish-Californians, who value it for its medicinal properties. A tea made of the bark is both tonic and mildly laxative. Its value is now widely known, and large quantities of the bark of the closely allied *Rhamnus Purshiana*, DC. (which is found in Oregon and Washington and attains a height of sometimes 30 feet) are annually gathered for the market. Both species so thoroughly run into each other that it is a question if one name does not really cover both.

California Lilac (*Ceanothus thyrsiflorus*, Esch.). Flowers blue paling sometimes to white, fragrant, individually small but showy in dense panicles; leaves evergreen, shiny, alternate, an inch or so long, elliptic, with three nerves from the base. A shrub or small tree from 2 to 25 feet high, the branches and twigs noticeably angled. Blooming in spring on chaparral-covered slopes, or at the sea-edge (where it is a low shrub), or among the redwoods, from the Santa Cruz Mountains northward to Oregon.

There are a score or so of species of Ceanothus indigenous to the Pacific Coast, to many of which, besides this one, the name California Lilac is applied. The little flowers are very interesting if noted closely under a magnifying glass, because of the odd-shaped petals, each with a long claw terminating in an incurving of the blade resembling a hood—or the whole arrangement suggesting a tiny tobacco pipe, to quote Doctor Sudworth. The different species are often difficult to identify, and the botanists' troubles in this respect are increased by the fact that hybridization is believed to take place between some species, making confusion worse confounded.

DEER-BRUSH (*Ceanothus integerrimus*, H & A.). Flowers white or sometimes blue, individually small, but very showy in feathery clusters sometimes 6 or 7 inches high, and 3 or 4 inches through. Leaves alternate, thin, ovate or oblong, 1 to 3 inches in length. Blooming in spring or early summer in the mountains from Southern California to Oregon. It covers considerable areas in the Yosemite region, where it is a noticeable sight. It is a shrub from 5 to 12 feet high with long flexible branches, and bark that tastes somewhat like wintergreen.

Deer and cattle find Deer-brush a palatable browse, so that this common name is of obvious origin. Soap-bush, too, is a name sometimes met with, which is descriptive of a very interesting property not only of this Ceanothus, but of all of the species I have tested. The flowers or green seed-vessels, if rubbed up for a moment or two in water, develop a more or less abundant lather which is cleansing like soap—a fact that campers and mountain ramblers will do well to bear in mind. The various species also go under the name of Myrtle, and are Far West cousins of that little bush New Jersey Tea, familiar to Easterners, whose leaves were used for a homely beverage during the Revolutionary War.

MALLOW FAMILY

(*Malvaceæ*)

Herbs or shrubs with frequently showy flowers, and 5 petals, the numerous stamens combined by their filaments into a column around the pistil, and united to the bases of the petals.

Malva Rosa (*Lavàtera assurgentiflora*, Kellogg). Flowers pink with darker longitudinal veins, some 2 inches across, borne on long axillary drooping footstalks. Leaves evergreen, maple-like, 5 to 7 lobed, 3 to 9 inches in diameter. A shrub, 4 to 15 feet high, leaves and twigs abounding in mucilage, wild on the Channel Islands of Southern California, and occasionally found as an escape from cultivation on the mainland. Blooming in spring and summer. In the environs of San Francisco it is a frequent hedge or windbreak around market-gardens.

It is a question how the Malva Rosa has become established in California. Possibly it is indigenous to the California islands, but there is a tradition that seeds were brought to California from Europe by the Franciscan Missionaries. The Spanish name by which it commonly goes, means "red mallow." The long name commemorates the brothers Lavater, Swiss naturalists of a couple of centuries ago.

Wild Hollyhock (*Sidálcea humilis*, Gray). Flowers pink or rose-purple, rather showy, in terminal racemes or spikes; the column of stamens usually in two series, the outer of 5 distinct clusters of stamens, the inner or terminal one of about 10 sets. Calyx without bractlets at base. Basal leaves round with rounded teeth or shallow lobes, the stem leaves deeply cut into about 7 fingers, with 3-lobed divisions. A rather hairy perennial with numerous stems 8 inches to 2 feet long, from a woody stock or root; blooming from February until May, and common on grassy hills and mesas of the California Coast region from San Diego north.

Mingled with plants as described above, one will also find some upon which the deep-colored flowers are smaller and with stamens which are without developed anthers. The children's name of Wild Hollyhock for the flower is fairly descriptive, and not far astray, since hollyhocks, while of a different genus, are still of the same family. The genus Sidalcea is confined to our West, and there are about a dozen species on the Pacific Coast, but none so common as *S. humilis*. They are of difficult determination.

DESERT MALLOW (*Sphærálcea ambigua*, Gray). Flowers brick red, showy, about an inch across in wand-like, open panicles, topping whitish, scurfy stems a foot or two high growing in clumps. Leaves grayish green, palmate, prominently veined. Common throughout the desert regions of California on open hills and mesas and eastward to Arizona, Nevada and Utah.

For the proper identification of the different genera of the Mallow Family the seed vessels are often needful; and this is particularly the case with Sphæralcea, whose resemblance to Malvastrum is very great—the main distinction being in the fact that the cells of the ovary in Sphæralcea contain two ovules each, while in those of Malvastrum the ovule is solitary. After the identification of a plant as a Sphæralcea, however, the student's difficulties are only begun; for the characters that mark the various described species, run together in a way that makes differentiation exceedingly hard. The plant here pictured has sometimes been called *S. Emoryi*, Torr., and again *S. Munroana*, Dougl.; but Mr. S. B. Parish of San Bernardino, whose knowledge of the Southern California flora is most thorough, tells me he has the authority of Dr. Asa Gray himself for calling it *S. ambigua*.

FIVE SPOT. SPOTTED MALLOW (*Malvastrum rotundifolium*, Gray). Flowers showy, an inch or so across when expanded, lavender with a prominent reddish-orange spot at the base of each petal; borne in loose clusters in the axils of the leaves. Stigmas spherical. Leaves kidney-shaped, with shallow, toothed lobes and long petioles. An annual plant with reddish stems, rather hairy, from 6 inches to 2 feet tall, growing in desert sands, Southern California and eastward to Arizona, blooming in March or April.

Of the many beautiful flowers that enliven the floor of our Southwestern deserts for a brief period in the spring this Malvastrum is one of the most alluring and almost sure to attract the observant traveler's attention. Children are the originators of many common names for wild flowers, and this of Five-Spot, given to our plant by some bright youngsters of my acquaintance, is happily descriptive enough to become permanent. The flowers are shy about expanding fully, and the tendency of the petals to curve inward at the tips causes the blossom to present the appearance of a globe.

The name False Mallow is commonly applied in books to the various species of Malvastrum, of which there are 8 or 9 indigenous to the Pacific Coast. The name means Star-mallow.

FREMONTIA (*Fremontia californica*, Torr.). Flowers without petals, the calyx divisions bright yellow, simulating a corolla, from 1 to 3 inches in diameter, borne singly on short footstalks in the axils of the leaves. Leaves an inch or two across, rounded with a few shallow lobes, rusty underneath and somewhat leathery. Shrubs or trees from 6 to 25 feet high, the branches tough and flexible. Southern and Central California on dry hillsides, in bloom from May to July, according to location. Its greatest development is on the foothills of the Sierra Nevada. As a shrub it often forms dense thickets.

Fremontia is an unforgettable sight when in full bloom, the glorious flower a bright golden yellow. The name was given in honor of General J. C. Fremont, who discovered it, but among our mountaineers it is quite commonly known as Slippery Elm because of its mucilaginous bark, which tastes much like that of the true slippery elm, and is similarly used for the making of poultices. It is also called Leatherwood because of the toughness of the branches and bark.

Some botanists do not consider Fremontia as properly placed in the Mallow Family, and regard it as a member of the nearly related *Sterculiaceæ*—a tropical family that gives us chocolate.

VIOLET FAMILY

(*Violaceæ*)

Ours, low perennial herbs, the early flowers irregular, one petal produced at its base into a spur. Later there is often another crop of flowers produced on runners or short stems at the base of the plant, inconspicuous, without petals, but abounding in seeds.

WILD PANSY (*Viola pedunculata*, Torr. & G.). Flowers about an inch across, showy, golden yellow, the upper petals tinged with warm brown outside, the others veined with purple, borne on naked peduncles, sometimes 2 feet long, and overtopping the leaves, Plant 3 to 8 inches tall, with leafy stems, the leaves coarsely round-toothed. Common throughout Middle and Southern California in sunny, grassy places, and on mesas from the seaside to the foothills, blooming from February until May and often spreading over considerable areas. Few wild flowers have a surer place in the popular heart in California than the Wild Pansy. It is sometimes called Yellow Violet. Miss Armstrong records a Spanish-Californian name Gallito, which means "little rooster."

CREEPING VIOLET (*Viola sarmentosa*, Dougl.). Flowers light yellow, rather small, on slender stalks; leaves round, an inch across more or less, with rounded teeth, often with dark dots and rusty brown beneath. A trim little plant, prostrate and creeping by its slender stems. Blooming in spring and early summer in the Coast Ranges from the Monterey Bay region northward through Oregon and Washington.

This charming little violet is one of the most captivating of woodland plants, and is often met with in the redwood forests, making dainty mats upon the ground and drooping gracefully over bank edges. The specific name, *sarmentosa*, means "having many little branches." An Easterner's first impression of the California wild violets is usually one of surprise at the number of yellow-flowered species which are met, as compared with blue—the latter being the most usual color on the Atlantic Coast. Nevertheless there are a few blue-flowered species, one of which, the little Sierran Dog Violet (*Viola oxyceras*, Greene) is sure to be seen by visitors in the Yosemite region, as it is quite common in the Sierra Nevada.

TAMARISK FAMILY

(*Tamariscineæ*)

Shrubby plants with small, undivided, alternate leaves somewhat fleshy, and rather closely related to the Pink Family.

OCOTILLO. CANDLEWOOD (*Fouquièra splendens* Engelm.). Flowers tubular, bright crimson, crowded in terminal spikes 6 or 8 inches long; a shrub with fragile wood, the stems without branches, ashen gray, thorny; and with small, sessile, axillary leaves, borne near the summit of the stems.

This striking plant, with masses of whip-like stems rising like a fire-tipped, thorn-encrusted, lignified fountain to the height of sometimes 15 or 20 feet from the desert sands, is found abundantly throughout the arid regions of Southeastern California, eastward to Texas and south to Mexico, blooming in late winter and in the spring. It is of considerable economic importance on the desert, the stems being used for fences and even house walls. The stem is fragrantly resinous and waxy and splints of it may be lighted and will burn like candles. Ocotillo (pronounced *ocotee'yo*), is a diminutive of *ocote*, a Mexican pine whose wood is used for torches. Fouquiera commemorates a French doctor of medicine, P. E. Fouquier.

LOASA FAMILY

(*Loasaceæ*)

Herbaceous plants, often with rough, hooked hairs. Leaves alternate. Stamens very numerous, inserted with the 5 or 10 petals upon the calyx throat, the outer tending to be petal-like. The seed-vessels crowned with the persistent calyx lobes.

Blazing Star (*Mentzelia Lindleyi*, T. and G). Flowers showy, opening toward evening, 3 inches or more in diameter, golden yellow, the five petals silken of texture and terminating in pointed tips, the many stamens making a conspicuous tufted centre to the flower. Leaves ovate or lanceolate, wavy-toothed. An annual plant 2 to 3 feet high with glistening yellow stems, blooming in summer in the mountains of Central California.

There are half a dozen or more species of Mentzelia indigenous to the Pacific Coast, but the genus is fairly well marked by its characteristic shining stems, conspicuous clustered stamens, and the top-shaped calyx with its five noticeable lobes. The barbed hairs that clothe the plants cause them to cling to one's clothing, on which account, Spanish speaking people have humorously given it the name *Buena Mujer*, good woman.

CACTUS FAMILY

(*Cactaceæ*)

Peculiar, often grotesque, fleshy perennials, more or less armed with bristles and spines, and rarely endowed with leaves; easily recognized as a family, but individually often very difficult to place in their proper species. There are about 20 genera and 1,000 species, nearly all natives of America, especially Mexico, but many species are now naturalized in the Old World, also. On the Pacific Coast they are confined to the regions adjacent to Mexico.

CHOLLA (pronounced *cho'ya*). (*Opuntia Bernardina*, Engelm.). A much branched plant with slender, cylindrical, jointed stems, 2 to 6 feet high, the stout yellow spines barbed at the tip and enclosed their whole length in a papery sheath that slips off readily. Flowers greenish-yellow with a tinge of red, an inch broad or a little more; blooming in late spring and early summer on arid plains in Southern California.

There are numerous species of the cylindrical-jointed Opuntias in the Southwest, and in a general way the Mexican name Cholla is applied to all, in contradistinction to the flat-jointed species which are called Tuna-cactus or Nopál.

NOPAL. PRICKLY PEAR (*Opuntia Lindheimeri*, Engelm.). Plants with broad, flat joints and usually forming thickets, from 3 to 10 feet high, joints from 6 inches to a foot long, spiny and bristly. Flowers sessile, yellow or reddish, about three inches in diameter. Blooming in spring or summer in the dry valleys and on the foothills and mesas even along the sea, throughout Southern California. The dark red fruits —"prickly pears"—are edible, though seedy; but should be handled with great care until the bristles are rubbed off, as these fasten themselves promptly in one's fingers and are very annoying.

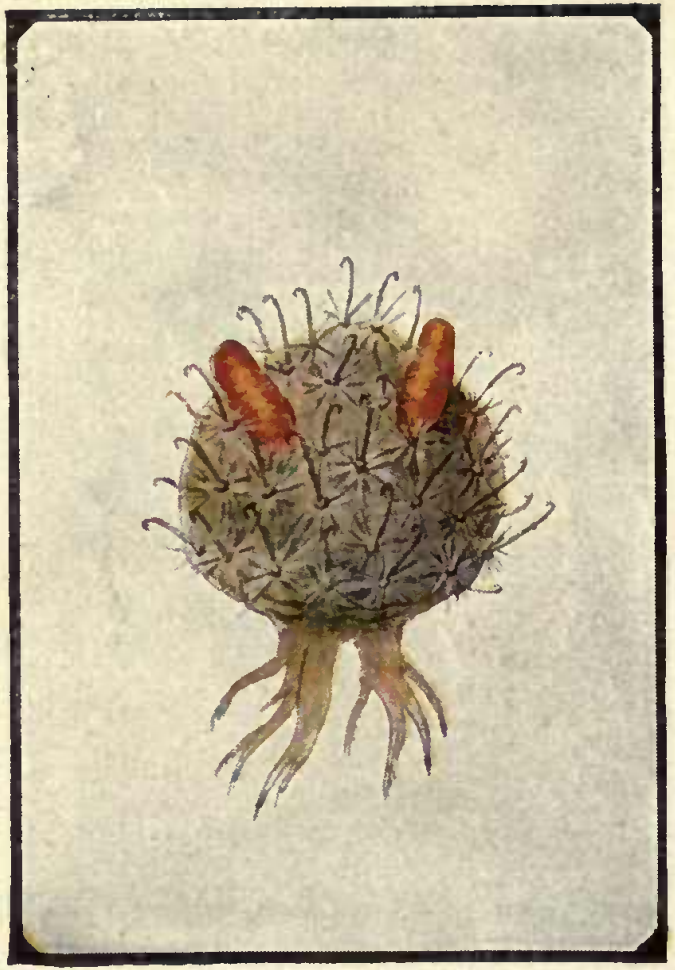
This Opuntia is somewhat variable and botanists distinguish two varieties, *littoralis* of the seacoast, and *occidentalis*, found farther inland. The fruits are called *tunas* by the Mexicans and Indians, who use them to some extent for food; the plant itself is *nopal*.

About old dwellings and particularly the Franciscan Missions, two larger-fruited species are found, brought up from Mexico a century or more ago and planted for hedges and for the superior fruit. One of these *O. Ficus-Indica*, bears "pears" of a pale straw color; the other *O. Tuna*, has a fruit that is red.

BISNAGA. BARREL CACTUS (*Echinocactus cylindraceus*, Engelm.). Stout, cylindrical, leafless plants a foot or more in diameter and from 1 to 6 feet or even more in height, prominently ribbed and bearing on the ribs bundles of hooked spines that are transversely barred. Flowers greenish-yellow, an inch or so in diameter, forming a circlet at the top of the plant; blooming in the spring on the desert and arid hillsides of Southeastern California and eastward.

Bisnaga is the common Mexican name for Echinocactus, of which there are several species in the Southwest. The firm, juicy heart of the big cylinders has the quality of an unripe water-melon and is to some extent used in the making of the so-called cactus candy for sale by confectioners. It is as the water barrels of the desert, however, that the Bisnagas are best known. If the top is cut off and the pulp of the interior pounded up, it yields a considerable quantity of drinkable water, capable of assuaging thirst.

The spines are quite beautiful and those of one species have been used by Indians for fishhooks, and of another by white men for gramophone needles.



Strawberry Cactus (*Mamillaria Goodridgii*, Scheer.). The Mamillarias are little round plants a few inches high, covered with small nipple-like tubercles, each crowned with a tuft of spreading spines. In *Mamillaria Goodridgii* and some other species the central spine is elongated and bears a hook at the tip. The flowers arise between the tubercles and are small and inconspicuous, white or pinkish in *M. Goodridgii*, and appear in the spring. The fruit which follows is quite showy, a scarlet, club-shaped berry, and is edible, giving the plant the common name Strawberry Cactus. The hooked spines are responsible for another popular name—Fishhook Cactus; and the tubercles that dot the plant have gained it yet another—Nipple Cactus, which is really only an English version of the Latin Mamillaria.

The Strawberry Cactus is found on the dry hills of San Diego County, California, and southward in Lower California, as well as on the neighboring islands. It affects gravelly or sandy soil, often among rocks, and the flowers are fully open only in sunlight and for a short time. The whitish spines are quite ornamental in their arrangement, radiating in a flat plane about the fish-hook.

HEDGEHOG CACTUS (*Cereus Engelmanni*, Parry). The genus Cereus in our country is distinguished by oval, cylindric or columnar stems, with vertical ribs and bunches of spines borne on the ribs. The flowers are produced on the older parts of the plants just above the spine bunches. *Cereus Engelmanni* is about a foot high, and when in bloom, makes one of the striking floral features of the Colorado desert region of Southeastern California. The large magenta flowers, $2\frac{1}{2}$ to 3 inches across, glow like crimson suns on the stems of the plant from April to June, but only when the sun is shining. The green stigmas are a noticeable feature.

Cereus Engelmanni is a humble cousin of the huge *Cereus giganteus*, the floral emblem of Arizona, and instead of putting its energy into a single column of growth as the latter does, it prefers to distribute it and make a number of short cylindric heads from one base. It is abundant on the lower slopes of the mountains facing the Colorado desert of California and extends eastward to Arizona and Utah.

EVENING PRIMROSE FAMILY

(*Onagraceæ*)

Herbaceous plants, the flowers with 4 petals, and usually 8 stamens, the stigma 4-lobed or capitate, and the long calyx tube adherent to the ovary.

Wild Fuchsia (*Zauschneria californica*, Presl.). Flowers 1 to 1½ inches long, scarlet both calyx and corolla, funnel-form with exserted stamens and style, disposed in loose racemes at the top of leafy, woody stems, 1 to 3 feet long, much branched. Leaves grayish-green. Blooming in the late summer and throughout the autumn, in Central and Southern California and eastward to Wyoming and New Mexico, in dry or rocky soil, often painting considerable areas with vivid color. It is common in the Yosemite region from the foothills to about 6,500 feet altitude (according to Dr. Hall), but on account of its late flowering, many visitors there never see it. In Southern California at low altitudes it may be found in bloom until the year's end.

The botanical name of the Wild Fuchsia commemorates a German botanist, Zauschner—an honor that costs our American tongues dearly.

FAREWELL-TO-SPRING (*Godètia vimínea*, Spach.). Flowers 2 inches or so across, crimson or purplish, often with a darker blotch at the bases (which are sometimes yellowish) of the petals, the funnel-form calyx tube produced above the ovary, the lobes more or less cohering and turned to one side; disposed in leafy racemes, on stems from a few inches to 3 feet high. Leaves alternate, narrow and entire, ½ inch to 2 inches long. Blooming in spring and early summer on hillsides and in dry meadows of Central and Northern California northward through Oregon.

There are more than a dozen species of Godetia (a name by the way given in honor of the Swiss botanist Godet), rather difficult of determination by the amateur, though the genus is well enough marked. The common name Farewell-to-Spring is appropriate to all, although in Southern California spring is by no means departing when they begin to appear. From Monterey to the Mexican border, on grassy hillsides, we may find the lovely species *Godetia Bottae*, Spach., a slender plant, 2 to 3 feet high, with pinkish or lilac cups of bloom dotted in purple, and a purplish or whitish centre.

CLARKIA (*Clarkia élegans*, Dougl.). Flowers reddish purple or pink, an inch or more in diameter, the petals rhomboidal in outline narrowed abruptly to long, slender claws; nodding in the bud in racemes at the summit of simple or branched annual stems from a few inches to several feet in height—even 6 feet in damp ground. Leaves an inch long or so, alternate, ovate to linear, and usually toothed.

Clarkia is one of the commonest of California wayside flowers in spring and early summer, and is distributed on hillsides and valleys from Mendocino County to Los Angeles, and on the lower altitudes of the Sierra Nevada. It is a plant of a blushing disposition—not only petals and sepals being pronouncedly reddish, but stamens, seed-vessels, and even the foliage all showing the same fiery tendency; and when occurring in masses, as is often the case, it is very showy.

In the Yosemite region, as well as northward and southward along the mountains, and eastward to Nevada and Utah, the species *C. rhomboidea*, Dougl., is frequently found. It is a smaller plant, and the flowers are distinguished by petals with claws that are broad and toothed.

CLARKIA (*Clarkia concinna* [F. & M.] Greene). Flowers rose-pink, petals nearly or quite an inch long with 3 terminal lobes; stamens only 4. Calyx tubes very slender. Stems annual from a few inches to 2 feet high. Blooming in summer in the Coast Ranges of California, often under the shade of trees, and very showy. The plant was originally described as *Eucharidium concinnum*, the filiform calyx tube and the 4 stamens being thought to entitle it to generic distinction; but most botanists assign it to Clarkia.

The name Clarkia commemorates that gallant old Virginian, Captain William Clark of the famous Lewis and Clark combination of 1804-6—the first expedition to cross the American Continent. Lewis was a member of the American Philosophical Society of Philadelphia, and on the trip gathered plants enthusiastically. Among these were specimens of a beautiful flower collected in Idaho or Montana, upon which the genus *Clarkia* was established. That was *Clarkia pulchella*, Pursh., not found in California, but abundant in Oregon and Washington and eastward to the Rockies. It, like *C. concinna*, has 3-lobed petals, but besides 4 perfect stamens has 4 rudimentary ones.

DESERT EVENING PRIMROSE (*Oenothèra trichocàlyx*, Nutt.). Flowers showy, white with a yellow glow at the heart, turning gradually to pink, 2 or 3 inches in diameter, nodding in the bud, the calyx very hairy; borne on long axillary peduncles. Leaves gray-green, narrow, 2 or 3 inches long, wavy-toothed or somewhat lobed. The plant is an annual with white, stoutish stems.

This Evening Primrose is one of the most charming of desert wild flowers, and may be found in bloom in the spring on both the Mojave and Colorado deserts of California, and thence eastward to Wyoming, Arizona, and New Mexico. The plant is of low habit barely exceeding 6 inches in height. The exquisite white blossoms, which are faintly fragrant, expand in the afternoon to remain open until next morning when they droop and wither.

The genus *Oenothera*, as originally understood, was a very large one of species mostly indigenous to North America. It has been one of the battlegrounds, however, of botanical nomenclaturists who have sought to dismember it into a dozen different parts. Advocates of latter day nomenclature describe our Desert Evening Primrose under the name *Anogra trichocalyx* (Nutt.), Small.

Sun-cups (*Oenothèra bistorta*, Nutt.). Flowers bright yellow, nearly an inch in diameter, often with a brownish spot at the base of the petals, axillary on leafy stems which are usually 2 or 3 inches high, or almost flat to the ground, though in some situations they attain a height of a foot or more. The pistil is capped with a tiny round-ball of a stigma. Leaves about 3 inches long, somewhat toothed. A common plant in Southern California, blooming in sunshine from February to June, on open plains and in gravelly or sandy washes, often brightening acres with its sunny color.

The specific name of this Oenothera means "twice-twisted," and was given because of the squirming seed vessels, which are quite odd—a characteristic, however, which is shared with some other species. In Central California near the Coast the name Sun-cups is applied to *Oenothera ovata*, Nutt., a low plant with wavy-margined leaves in the form of a rosette. The bright yellow flowers, quite similar to those of *Œ. bistorta*, are remarkable from the fact that what appear to be their long peduncles are really the slender calyx tubes leading down to the underground seed vessels.

Beach Primrose (*Oenothèra cheiránthifolia*, Horn.). Flowers showy yellow, frequently turning greenish when withering, axillary upon the trailing, white, downy stems which are 2 feet or so long, and very leafy. Leaves thickish, oblong, the upper clasping, and all of them gray with a minute downiness, that gives the entire plant a silvery look.

The Beach Primrose, like most of its charming family, is a lover of the open sunny places, and is a very common plant on the sea beaches of Southern California, and as far north as Monterey, forming conspicuous mats upon the sands, whether in flower or not. The specific name means "with leaves like *Cheiranthus*," the wall flower.

The meaning of the name *Oenothera* is a puzzle, and has been variously defined. It is certainly of great antiquity, but just what plant in ancient times was meant by it is open to conjecture. Dr. Nathaniel L. Britton, Director of the New York Botanical Garden, is convinced that the word means "wine-scenting," because the root of the original Old World plant was probably used for perfuming wine. This appears to be the most reasonable explanation so far offered.

PARSLEY FAMILY

(*Umbelliferæ*)

Herbs with usually hollow grooved stems and alternate decompound leaves, the petioles often dilated at the base. Flowers small, generally in compound or single umbels. The mature seed vessels are necessary for the identification of most of the genera and species.

EÙLOPHUS (*Eùlophus Bolánderi*, C. & R.). Flowers white, in long-stalked compound umbels. Leaves 3 to 6 inches long, the numerous divisions very narrow and thread-like. Stems a foot or two high. Blooming in summer in damp meadows of the higher mountains.

Eulophus Bolanderi is very abundant in the Yosemite region and the Sierra meadows, which are often white in summer with the lovely flat-topped flower clusters. The specific name was given in honor of Henry N. Bolander, an industrious collector of California plants between 1863 and 1875, during a part of which time he was connected with the State Geological Survey.

There is a closely related species, *E. Parishii*, C. &. R., distinguished by leaves with only 3 or 4 divisions, which are much coarser than those of *E. Bolanderi*.

FENNEL (*Fœnículum vulgáre*, Gært.). Flowers yellow in compound umbels, leaves decompound and finely dissected into thread-like segments. Stout, smooth herbs, 3 to 6 feet high, with a fragrance when crushed of licorice. Common along roadsides, in waste places and near cultivated grounds, blooming in spring and summer.

Fennel is an Old World plant and perhaps owes its presence on the Pacific Coast to the Franciscan Missionaries; for the seeds have been used from time immemorial in domestic medicine as a carminative, and would naturally have formed a part of the Padres' importations. Spanish-Californians call the plant Anís Hinojo (*ah-nees' ee-no'-ho*), which means "anise fennel," and may have given rise to the name by which Americans on the Coast frequently call the plant—Sweet Anise. In some parts of California the children, who enjoy the pleasant taste of the leaves and stalks, long ago dubbed it Ladies' Chewing Tobacco.

Famous in the folk-lore of the Old World, fennel links us with the classic past, when victors in the public games were crowned with it, and gladiators had it mixed with their food to make them strong.

DOGWOOD FAMILY

(*Cornaceæ*)

Usually trees and shrubs with simple opposite leaves without stipules. Floral parts in 4's, petals sometimes wanting. Calyx adhering to the seed vessels.

Quinine Bush (*Gárrya elliptica*, Dougl.). Flowers grayish-green without petals, and of two sexes on separate plants, disposed in axillary, drooping catkins either solitary or clustered. Leaves evergreen, leathery, wavy-margined, white-woolly beneath. A shrub 5 to 8 feet high (or rarely a small tree in Oregon) blooming as early as February, in the hills from Central California to Washington.

The pendent catkins of the Quinine Bush are very noticeable —particularly the male catkins, which are from 2 to 6 inches long. Each flower is enclosed in a funnel-shaped bract, and the whole catkin resembles a swinging string of tiny bells. The pistillate catkins become at maturity clusters of acid, bitterish berries. The bark and leaves of Garrya possess a bitter principle, and their use in fevers has suggested the common name Quinine Bush. Garry, whom the botanical name commemorates, was a patron of David Douglas, the famous collector.

NUTTALL'S DOGWOOD (*Cornus Nuttállii*, And.). Flowers small and greenish in a button-like cluster surrounded by a circle of 4 to 6 showy white or pinkish bracts that resemble petals. Leaves opposite, acute at each end, strongly veined, short petioled, turning brilliantly red and orange in the autumn. A tree ordinarily 20 to 30 feet high, but sometimes twice that; blooming in May or June, in the mountains generally near streams, both in the Coast Ranges and the Sierras from Southern California to British Columbia. Occasionally flowers are found upon the trees in autumn.

Nuttall's Dogwood is readily recognized by any one familiar with the Flowering Dogwood of the East, which it resembles, but its blossoms are larger. The name preserves the memory of Thomas Nuttall, the famous naturalist who visited the Pacific Coast some 80 years ago and made important collections. Readers of Dana's "Two Years Before the Mast," will remember the humorous description of him at San Diego, where the sailors nicknamed him "Old Curious."

HEATH FAMILY

(*Ericaceæ*)

Trees, shrubs, and perennial herbs. Leaves of ours mostly evergreen and rigid, or occasionally reduced to scales. Anthers mostly opening by little holes at the top.

California Huckleberry (*Vaccínium ovàtum*, Pursh.). Flowers pink or white, waxen, small and bell-shaped, about $\frac{1}{4}$ inch long, in short clusters from the axils of the alternate, shiny leaves. Blooming in spring and early summer in the Coast Ranges from Central California to Oregon and Washington. Frequent in the redwood forests.

The California Huckleberry is one of the loveliest of shrubs, whether in flower or fruit or neither. The red stems, clothed with glossy evergreen leaves, are very graceful rising to the height sometimes of 8 feet, though usually less. They are cut in large quantities for Christmas greens. The purplish-black berries, though small, are juicy and good.

MADROÑO (*Arbùtus Menzièsii,* Pursh.). A shrub or stately tree, distinguished by shiny, evergreen foliage, a reddish-brown trunk, and the thin red bark of the limbs and upper stem, which peels off in cinnamon-like quills, and reveals an under-bark of green. The mature leaves are $2\frac{1}{2}$ to 5 inches long, leathery like those of magnolias. They turn in summer to tones of red and fall to the ground, which then becomes gay with the mingled reds of ripened foliage and bark. The flowers are waxen-white, urn-shaped, individually small but borne in large, showy clusters resembling Lilies of the Valley, and appear in February and early spring. In the autumn these are succeeded by the abundant, berry-like fruit, which is brilliant orange-red in color, each berry about the size of a pea.

The Madroño is at its best in the Coast Ranges from the neighborhood of San Francisco to Puget Sound, though it is met with sparingly as far south as Mexico. The name dates from the Spanish settlement of California, Madroño being the Spanish for the European Strawberry-tree (*Arbutus Unedo*) for which our tree was at first mistaken.

MANZANITA (*Arctostáphylos Manzanita*, Parry). Flowers white or pinkish, urn-shaped, in short, crowded racemes. Leaves pale green, thick, often vertical by the twisting of the footstalk. A variable shrub or small tree, 3 to 25 feet high, frequent in the chaparral belt of the California Mountains, blooming sometimes in midwinter but usually from February to April, the blossoms "like little classic vases cut in alabaster," to quote the happy simile of Mr. J. S. Chase in "Yosemite Trails."

The Manzanita is of striking appearance because of its very crooked, hard, polished branches from which the thin, chocolate-red bark peels in shreds and patches. The name is Spanish for "little apple," and well describes the rosy little berries which abound upon the bushes in summer. When green these berries are rather tart and chewed in the mouth are a relief from thirst, but the pulp had best not be swallowed. When mature they are dry and mealy, and Indians have found them nutritious, both cooked and raw, though too free consumption induces serious intestinal stoppage. A capital cider may also be made from them, and white mountaineers prize them for jelly making.

WESTERN AZALEA (*Rhododendron occidentále*, Gray). Flowers showy, 2 to 3 inches long, white or pinkish, funnel-form with spreading lobes one of which bears a yellow stripe or blotch; stamens and pistil long exserted; borne in umbels at the branch ends, fragrant but sticky. Leaves deciduous, bright-green, 2 to 4 inches long, clustered at the branch ends.

The Western Azalea is frequent along streams in the mountains throughout California and northward to Oregon, where, like the far eastern cousin of Atlantic woodlands which it resembles, it often goes by the inaccurate name Wild Honeysuckle. The flowers open in early June, but are usually gone by the last of July. The bushes are from 2 to 10 feet high, and the luxuriant flower masses, almost hiding the foliage, make a scene of all but tropical magnificence extending some times for miles along the mountain waters. Visitors in early summer to the Yosemite region find in such fragrant Azalea thickets one of the lasting pleasures of that wild world.

While the Azalea is classed in the genus Rhododendron by most botanical writers, there are some who prefer to consider it as a separate genus. The botanic distinctions, however, are hard to establish, in spite of a difference in general aspect that is noticeable.

Rose Bay (*Rhododéndron califórnicum*, Hook). Flowers rose-pink, about 2 inches in diameter, somewhat bell-shaped, the upper corolla-lobe spotted with yellow; borne in terminal many-flowered umbels, without fragrance, in the midst of clustered, leathery, evergreen leaves from 4 to 6 inches long or even more. A shrub from 3 to 15 feet high, sometimes forming dense thickets, acres in extent, in the mountains from Northern California northward through Oregon and Washington. Blooming in the spring and early summer.

The compelling beauty of the Rose Bay has caused it to be popularly adopted in Washington as that State's floral emblem. It resembles, but exceeds in charm of flower, the famous Carolina Rhododendron (*C. Catawbiense*) which floriculturists long ago hybridized with a Mediterranean species to produce the variety most commonly cultivated nowadays in American gardens. Our *R. Californicum* has been introduced into English gardens where it has proved a success.

Rhododendron is a name that comes down to us from classic times and means Rose-tree. The ancients, however, did not use the word for the plants we call so, but to designate the oleander.

HEATHER (*Bryanthus Bréweri*, Gray). Flowers crimson, saucer-shaped, about ½ inch across, stamens and style much exserted; borne in showy clusters at the branch ends. Leaves stiff and crowded, bristling out on all sides of the stems, linear with rolled-back margins.

Bryanthus is a genus of heath-like, arctic-alpine plants, of which the Pacific Coast has two or three. Of these *B. Breweri* is the best known and will be observed by every visitor to the High Sierra of California, where it spreads its charming mats of ruddy bloom over gravelly slopes and about mountain tarns throughout July and August. It begins to appear at about 10,000 feet elevation. It occurs as far south as the summit of Mount San Gorgonio in Southern California.

The botanical name means Moss-flower, given, Doctor Gray tells us, because the originally described species grew among mosses; and the specific name commemorates the geologist Wm. H. Brewer of the California Geological Survey of half a century ago. The popular name Heather seems well established, but is somewhat unfortunate, as the Heather of literature is quite dissimilar to this, and is not a Pacific Coast plant.

White Heather (*Cassìope Mertènsiana*, Don.). Flowers white, or pale pink, bell-shaped, like those of Lily-of-the-valley, solitary and nodding, on erect, naked peduncles rising from the axils of the leaves. Leaves about $\frac{1}{8}$ inch long, boat-shaped, and overlapping one another in the manner of scales, in four ranks upon the branches, which rise barely a foot above the ground.

This odd, little plant with slender, creeping stems that suggest a Club-moss in their habit, is found blooming in summer among the rocks of the higher altitudes of the Sierra Nevada near timber line, from the Yosemite region northward. It was the favorite flower of John Muir, whose writings contain many references to it—his "lowly, hardy, adventurous Cassiope." Its tangled beds make a notable feature in alpine meadows and on the borders of glacier lakes upon the crest of the Sierra northward along the Cascades of Oregon, Washington, and British Columbia to far-off Alaska. It is found usually at slightly higher elevations than Bryanthus.

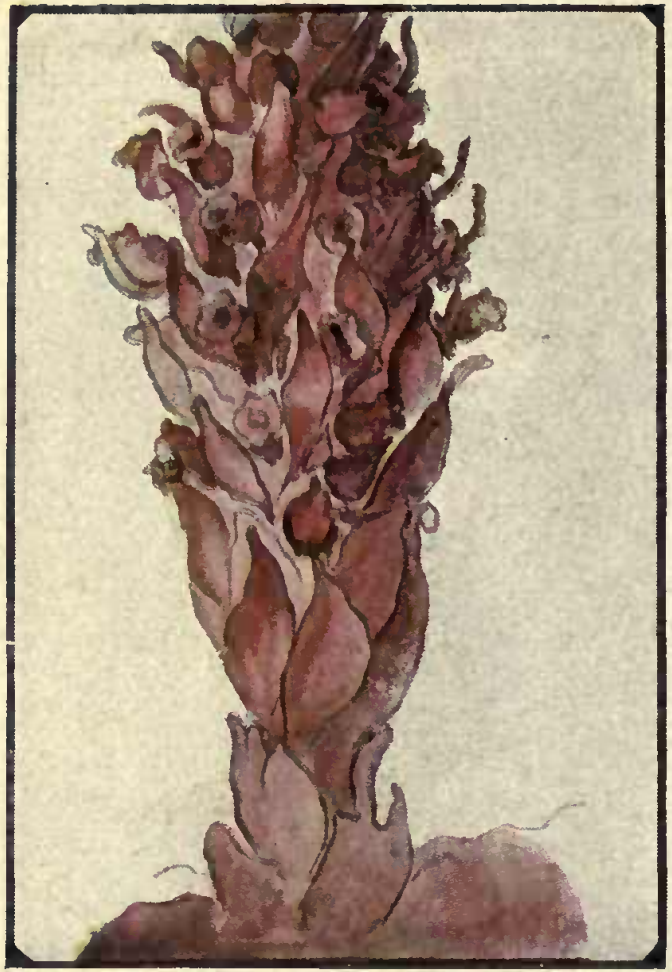
SALAL (*Gaultheria Shállon*, Pursh.). Flowers white or pinkish, about $\frac{1}{3}$ inch long, urn-shaped, viscid, in elongated, many-flowered racemes. Leaves ovate, evergreen, leathery, finely toothed, alternate, 2 to 4 inches long. A shrub 1 to 3 feet high, sometimes taller and sometimes prostrate; with stout spreading stems—branches and flower stalks, as well as the corolla, sticky hairy. Blooming in spring or early summer in the shade of trees in the Coast Ranges from Santa Barbara northward to British Columbia.

The Salal is a feature of the forest floor-covering under the redwoods of Northern California; but its most robust development is attained in Oregon and the upper limit of its range. In autumn the plants are adorned with purple-black berries resembling small grapes, of a spicy fragrance and taste. The Oregon Indians made them a part of their diet. Lewis and Clarke's journal usually records the aboriginal name for the plant as Shallun, but in one place as Shelwel. The Indians make a kind of syrup of the berries and also, according to the journal, a sort of bread, "which being boiled with roots forms a soup, which was served in neat wooden trenchers."

PRINCE'S PINE (*Chimáphila Menzièsii*, Spreng.). Flowers fragrant, white or pinkish, the 5 waxen, roundish, concave petals spreading and somewhat turned back; borne singly, or 2 or 3, on a terminal naked stalk; the sticky stigma quite prominent, button-like with blunt rays. Leaves narrowish, leathery, dark green, the upper surface sometimes mottled with white. A low evergreen plant, rarely 6 inches high, branching from woody runners, in coniferous woods from Central California to British Columbia; blooming in summer.

The name Chimaphila means "winter-loving," and was given the genus by the botanist Pursh when he separated it from the genus Pyrola some species of which were much used in his time for indoor winter decorations, under the general name of "winter-green."

The well-known plant of Atlantic Coast woodlands called Pipsissewa (*Chimaphila umbellata*, Nutt.), is also found on the Pacific Coast and in similar situations to *C. Menziesii*, and may be distinguished from the latter by the greater abundance of its leaves which are never spotted, and by its larger flowers, some in clusters of 4 to 7. The leaves of Chimaphila possess a principle which has occasioned their use in medicine to some extent as a tonic, astringent, and diuretic.



Snow Plant (*Sarcòdes sanguínea*, Torr.). Flowers and the whole plant red or sometimes tinged with yellow; a stout, fleshy, columnar plant, 6 inches to a foot or so high, clothed below in place of leaves with shingled, fleshy, pointed scales, the bell-shaped flowers occupying the upper half of the plant in the form of a thick spike, mingled with short curling bracts. Blooming in late spring or summer, often several together, in the litter of the forest floor at altitudes above 4,000 feet in the Sierras of California south to San Pedro Mártir in Lower California, north to Oregon and eastward to Nevada.

The Snow Plant is believed to be an example of symbiosis, a case of partnership with a fungus which lives upon its roots and acts as agent to gather nitrogen from the soil for its host. The common name merely indicates that it is sometimes—by no means always—found blooming in or near the snow. In the Yosemite National Park, where it is always a curiosity to visitors, it is forbidden by law to pluck the plant, in order that it may not be exterminated.

PINE-DROPS (*Pterόspora Andromedèa*, Nutt.). Flowers white or yellowish, urn-shaped, drooping in a long, many-flowered raceme terminating the brownish-red, clammy, sticky stem which (including the flowers) is from 1 to 4 feet tall. Leaves reduced to scattered scales.

The fleshy, slender stems of the Pine-drops, straight as arrows, are an arresting sight in the oak and coniferous woods of the Pacific Coast, whether in summer when strung with their waxen bells of bloom, or in winter when the fruit capsules have taken their place. Its roots consist of clustered, coral-like fibres which attach themselves parasitically to other living plants. The lover of sights that have to be magnified will find interest in the tiny seeds, each of which bears a thin, translucent, veined wing many times larger than the seed itself. It was this characteristic which suggested the botanical name, meaning "winged-seeded."

Pine-drops is found not only on the Pacific Coast, but in the Rocky Mountain region south to Arizona, and eastward to New England. Some botanists place it and its parasitic kindred in a family to themselves which they call *Monotropaceæ*.

PRIMROSE FAMILY

(*Primulaceæ*)

Herbs with regular, perfect flowers, the parts of the calyx and gamopetalous corolla usually in 5's. Stamens of the same number as the lobes of the corolla, and opposite to them, inserted on its base.

Shooting Star (*Dodocátheon Clevelándi*, Greene). Flowers white, lilac or pinkish with a yellow ring at the base, the 5 deeply-cleft corolla lobes sharply reflexed, as in the garden cyclamen; the stamens and pistil bunched together and extending like a purple beak at the tip of the nodding flowers; blossoms borne in umbels on naked stalks from a few inches to a foot or more tall. Leaves thickish, in a basal tuft. Blooming from February until May in meadows and on grassy slopes in Southern California—one of the best beloved of Pacific Coast wild flowers, often called Wild Cyclamen.

JEFFREY'S SHOOTING STAR (*Dodocátheon Jéffreyi*, Van H.). Flowers nodding, purplish-pink, paling toward the base which is ringed with yellow, the corolla segments strongly reflexed, and the connivent anthers forming a beak; disposed in an umbel of 5 to 15 blossoms, on a naked stem from a few inches to 1½ feet high. Leaves clustered at the ground from 2 inches to over a foot long. Plant somewhat viscid, blooming in summer in wet mountain meadows of California, especially in the Sierra Nevada, northward to Oregon.

Jeffrey's Shooting Star is the species the visitor in the Yosemite is most likely to see, as it is very abundant in many places in that Park. In the High Sierras a variety occurs which is characterized by larger size and a strong fragrance of the herbage. This has been named var. *rédolens* by Doctor Hall. Dodocatheon is one of the genera that have given botanists a lot of trouble to systematize, because of the lack of stable, clear-cut differences between varying forms. The marked similarity of the flowers, however, in the half dozen Pacific Coast species, makes the genus itself of easy identification by the nontechnical.

PIMPERNEL (*Anagállis arvénsis*, L.). Flowers wheel-shaped, barely ½ inch in diameter, salmon-red (rarely blue or white), with a dark purple spot at the centre; borne singly on thread-like footstalks from the axils of the opposite sessile leaves. A low, spreading annual of neat habit with square stems, blooming in summer and common everywhere in waste places, along roadsides and in fields. Leaves and flowers are usually in pairs.

The Pimpernel is an immigrant from the Old World, and is at home quite across the Continent. One would call it a weed if one had the requisite indifference of heart thus to designate so innocent and appealing a face amid the grasses. The flowers are addicted to that habit—so captivating to the child-like mind—of closing at nightfall, or even at the approach of cloudy weather, whence a number of descriptive popular names for it in England, as Poor Man's Weather-glass, Shepherd's Warning, Wink-a-peep, and John-go-to-bed-at-noon. The last name is hardly deserved on our Coast, for the flowers stay open until much after noon, if the day be sunny.

Sierra Primrose (*Primula suffrutescens*, Gray). Flowers red-purple, ½ inch to an inch across, salver-shaped, the 5 lobes notched, borne in a loose umbel topping a leafless stalk 4 inches high or less. Leaves thick, wedge-shaped, several-toothed at the summit and tapering to a margined footstalk; all crowded on woody stems or rootstocks close to the ground. Blooming in summer in the crevices of rocks or on gravelly ridges on the higher peaks of the Sierra Nevada of California.

Visitors in the Yosemite National Park who essay the adventure of the High Sierra in late July or August, are pretty sure to be rewarded by the sight of the brilliant posies of this shrubby Sierra Primrose—the only true primrose native to California. It is one of those charming plants, to quote John Muir, "gentle mountaineers, Nature's darlings, which seem always the finer the higher and stormier their homes." Perhaps it is with plants as it is with a fine humanity, the storm and stress of life serves only to bring out the best in them.

PLUMBAGO FAMILY

(*Plumbaginaceæ*)

Usually herbaceous plants of the sea coast, with mostly basal tufted leaves. Corolla of 5 long-clawed parts united at the base or into a tube. Stamens opposite the corolla segments. Calyx plaited between its lobes, and persistent.

Sea Pink (*Armèria vulgáris*, Willd.). Flowers rose color or white, individually small, but showy in compact, clustered heads, with a sort of involucre beneath of chaffy bracts; on naked stalks from 3 inches to a foot high or so. Leaves narrow, without distinction of blade and petiole, crowded at the ground in dense tufts. Blooming in spring and early summer on downs and bluffs along the seacoast from California to Alaska.

The Sea Pink is native to the Old World as well as ours, and has long been a favorite in old-fashioned gardens under the name of Thrift. That has nothing to do with frugality, however, but is merely the survival of an old meaning of a participial form of *thrive*, and signifies "clustered," an allusion to the plant's growing in tufts.

STORAX FAMILY

(*Styracaceæ*)

A small order of shrubs or trees with alternate, simple leaves, and usually regular, perfect flowers. Stamens at least twice as many as the petals or corolla lobes, inserted on its tube or base, the filaments wholly or in part united.

CALIFORNIA STORAX (*Stŷrax califórnica*, Torr.). Flowers white, about an inch long, bell-shaped, the petals conspicuously overlapping in the bud, in loose, few flowered, drooping racemes which are axillary or terminal. Leaves deciduous, somewhat oval, an inch or two long. A downy-scurfy shrub, 5 to 8 feet high, blooming in April and May in the mountains of California.

The genus Styrax is of numerous species widely distributed in the warmer parts of the world. Some have been noted from very early times for their yield of valuable aromatic gums; others for the charm of their flowers. Our beautiful California Storax is in the latter class, and it has to some extent been introduced into cultivation, especially in England.

GENTIAN FAMILY

(Gentianaceæ)

Smooth, bitter herbs with opposite leaves. Stamens as many as the lobes of the gamopetalous corolla, inserted on its tube or throat.

CANCHALAGUA (*Erythræa venústa*, Gray). Flowers about an inch in diameter, pink or reddish with a yellow or white eye, borne in a loose, showy panicle on a stem 3 inches to 2 feet high. Leaves ½ inch to 1 inch long, lanceolate, sessile. A slender annual, blooming from April to July, on dry hills and grassy mesas of Central and Southern California—most abundant in the South.

Canchalágua is one of the most famous of Pacific Coast medicinal herbs, valued alike by Americans, Spanish-Californians and Indians as a febrifuge. The plant is gathered and dried, and a tea, made from it, is a standard bitter tonic in old-fashioned families. Because of the bitter principle resident in the plant, the name Wild Quinine is also given it. Kindred species in Mexico and South America possess similar properties.

MILKWEED FAMILY

(*Asclepiadaceæ*)

Herbs, vines or shrubs with usually a milky juice. Flowers 5-parted, the divisions reflexed in our genera; anthers united to the stigma in the form of a crown, with 5 hood-like appendages making a circle about it. Fruit a pod, the numerous seeds each bearing a tuft of silky hairs at the tip.

Woolly Milkweed (*Asclèpias èriocarpa*, Benth.). Flowers creamy white, the stamen-hoods each provided with an acute horn. Leaves short-petioled, 4 to 8 inches long; the whole plant, which is 2 to 4 feet high, densely clothed with a loose wool, even to the calyx. By roadsides and on hills, Central and Southern California.

The Woolly Milkweed is perhaps the commonest of several Pacific Coast species. The Indians obtained from the tough inner bark a strong fibre of which they manufactured carrying nets and rope; and the sweet, milky juice was used as a lotion for cuts and sores, and also as chewing gum.

PHLOX FAMILY

(*Polemoniaceæ*)

Herbs and shrubs with mostly regular flowers; calyx and gamopetalous corolla 5-parted, the 5 stamens inserted on the corolla tube. Style usually 3-lobed. Corolla twisted in the bud.

Bird's Eye (*Gília trícolor*, Benth.). Flowers funnel-form, ½ inch long, the spreading lobes pale lilac, the tube yellow with 5 purple spots at the throat; borne in few- or several-flowered clusters, on rather short peduncles. Leaves twice-pinnately parted into narrow divisions. A slender, branching, annual. 6 inches to 1 or 2 feet high. Common on hillsides of Western Middle California, blooming in the spring and early summer.

This charming wilding was one of the discoveries of that famous pioneer collector David Douglas, whom the Royal Horticultural Society of London sent to the Pacific Coast in quest of floral novelties nearly a century ago. Under a number of forms it has been a favorite in gardens both abroad and in our own country, being of easiest culture.

BLUE GILIA (*Gília capitàta*, Dougl.). Flowers blue, rather small, in crowded head-like clusters, stamens conspicuously exserted, an inch across or more, terminating long naked stalks. Leaves finely divided into numerous, very slender or even thread-like segments. A slender annual, a foot or so high, blooming in the spring in the Coast Ranges from Central California to Oregon.

There are two Pacific Coast species nearly related, that are known as Blue Gilia. The other, which closely resembles *Gilia capitata*, is *Gilia achillèæfolia*, Benth., which means the "Yarrow-leaved Gilia." It is a rather stouter plant, the blue or lavender flower clusters larger and less compact, sometimes 2 inches across. It is abundant in the Yosemite region, and southward in the foothills to Southern California where it will be found in flower from April to June. Both species are old favorites in gardens.

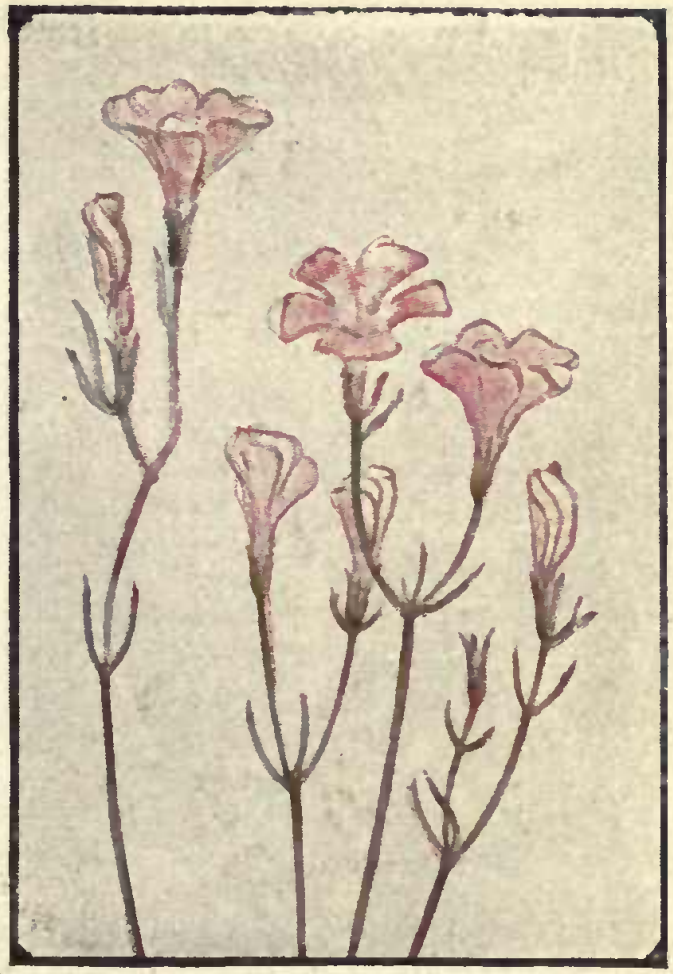
The name Gilia was given in honor of a Spanish botanist, Philip Gil, and is usually pronounced *jil'ia*, though some botanists call it *heel'-ia* in conformity with the Spanish pronunciation of the name which it commemorates.

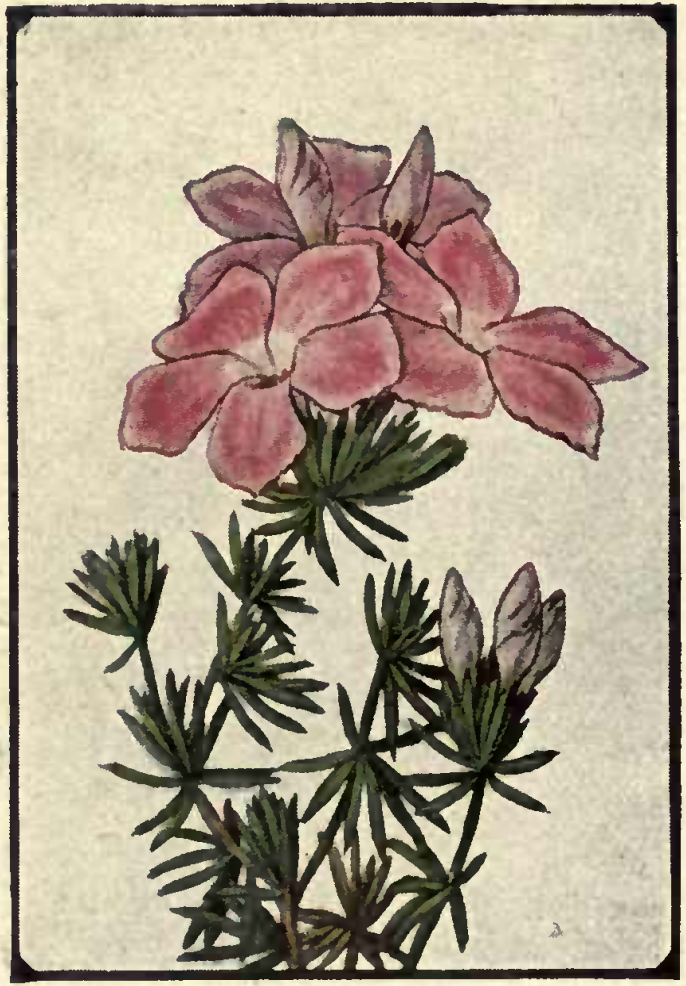
FRINGED GILIA (*Gília dianthòides*, Endl.). Flowers ¾ inch across or more, pinkish or lilac paling to white, with a yellow throat; funnel-form, the satiny corolla lobes fringe-toothed. Leaves opposite, narrowly linear or thread-like. A low annual, simple or branching from the base, often only an inch or two high and rarely if ever more than 6 inches; blooming from February till May, on sunny grassy mesas and in sandy washes of Southern California.

The Fringed Gilia is one of the choicest of spring annuals, and the sunny spaces where it grows are sometimes spangled for acres with the exquisite blossoms. The vital energy of the little plant goes aboundingly into the generous, showy flowers, in comparison with which the leaves and stems are insignificant—in fact, quite hidden by them, It has been introduced into cultivation both in this country and abroad under the name *Fenzlia dianthiflora*, Benth., and several varieties are employed in edgings and rockwork.

Evening Snow (*Gília dichótoma*, Benth.). Flowers salver-form, fragrant, white, an inch across or more, with a brownish margin on the outside, sessile in the forks of the branches or terminating long stalks. The scanty leaves are thread-like, simple or divided into 3 to 5 segments. A slender, branching annual a few inches to 1½ feet tall, blooming in spring in the foothills of Central California, and eastward in the deserts to Arizona.

My first acquaintance with this Gilia was rather dramatic. One morning on the Mojave Desert of California we pitched our camp in a spot that seemed innocent of any floral presence. In the late afternoon happening to look from my tent door, I was startled to see the ground all about white with myriads of expanded blossoms of this plant, well named Evening Snow. They remained open throughout the night exhaling a noticeable fragrance, and in the morning they folded themselves up very neatly like so many umbrellas, to repeat their performance the next night. The stems were so slight and scanty of leaf that when the corollas were shut, the whole plant seemed to sink invisible into the background of yellow desert.





PRICKLY PHLOX (*Gília califórnica*, Benth.). Flowers salver-form, 1 inch to 1½ inches across, rose-pink or lilac with a white centre, solitary and sessile or a few in a cluster at the ends of the branchlets. Leaves opposite and crowded along the woody branches, divided into several sharp-pointed, rigid, needle-like segments. A shrubby plant whose clustered, bristling stems grow to a height of 2 or 3 feet, their armor of spiny leaves making the flowers as hard to gather as thistle blooms.

Set like wild roses in gipsy hair, the bright blossoms of the Prickly Phlox glow in the dark tangle of the chaparral in late spring and early summer from Monterey southward, and only the blind can fail to notice them. In their season they are among the commonest of wild blossoms in Southern California—a favorite habitat being on dry hillsides, whence another popular name, Mountain Pink. It is also abundant in those tracts of semi-desert which everywhere in Southern California lie close to the borders of the irrigated country, and there blooms gloriously amid the cactus and bowlders of sandy washes.

Wild Bouvardia (*Gília grandiflóra*, Gray). Flowers funnel-form, salmon-color, borne in showy, terminal, hemispherical, clammy heads a couple of inches across. Leaves sessile, narrow and at least the upper alternate. Stems 1 to 2 feet high. Blooming in summer in dry ground in California northward to Washington, eastward to Nevada and Utah. Very common in the Yosemite region.

Like so many of the Gilias, this species was long ago introduced into cultivation abroad, but under the name *Collomia grandiflora*, Dougl. The genus Gilia, indeed, has been split up into a dozen or more genera by some botanists; but it is so difficult to establish the distinctions that the best usage has put most of them back into Gilia. About 50 species are indigenous to the Western United States. Another familiar one of the Sierra Nevada and the Rocky Mountain region, is the brilliant, scarlet *Gilia aggregata*, Spreng., of which Doctor Coville records a pretty Klamath Indian belief that in old times the wild doves drank no water but only the nectar of this flower; so that to this day they call it *ohl'sam bohn'was*, "the drink-plant of the doves."

WATERLEAF FAMILY

(*Hydrophyllaceæ*)

Herbs or sometimes shrubs, with regular 5-parted flowers generally in coiled spikes or racemes, the stamens borne on the lower part of the corolla tube. Styles 2 or twice cleft.

BABY-BLUE-EYES (*Nemóphila insignis*, Dougl.). Flowers pure blue with a white centre, $\frac{1}{2}$ to an inch or so in diameter, solitary on terminal or lateral stalks. Leaves divided into 7 to 9 divisions, these often more or less lobed again. A low, rather hairy annual, spreading by stems of tender texture; blooming from February to May in more or less shaded places throughout California.

Baby-blue-eyes is one of those ethereal creations in the plant world, of which it is hard to speak except in terms of poetry—it appeals so directly to the heart. If David Douglas had done nothing more than discover this "lovely harbinger of the California spring," as he called it, he would have deserved the gratitude of the world; for through him it was introduced to the gardens of Europe, where it has long been a favorite.

Spotted Nemophila (*Nemóphila máculata,* Benth.). Flowers about an inch to 1½ inches in diameter, saucer-shaped, white, purple-dotted and with a purple blotch at the tip of each lobe of the corolla. Leaves lyre-shaped, deeply 5- to 9-parted. A low, hairy annual with spreading stems; blooming in summer in Central California from the Sacramento Valley to the Sierra Nevada, including the Yosemite region. Occasionally one meets with a form in which the purple-blotch is absent. This is the variety *concolor.*

There are half a dozen species or more of Nemóphila indigenous to the Pacific Coast. Not all are as showy of blossom as the Spotted Nemóphila, which, like its charming cousin, Baby-blue-eyes, has long been cultivated in gardens. The flowers of all are distinguished by the calyx being provided between each division with an extra lobe which is sharply turned back. The word Nemóphila means "grove-loving," an allusion to the plants' liking for shady places. Among gardeners the cultivated forms sometimes go under the name California Blue-bells, an unhappy misnomer, for blue-bells they are not.

WHISPERING BELLS (*Emmenánthe penduliflòra*, Benth.). Flowers about ½ inch long, cream-colored or light yellow, bell-shaped, erect at first, but eventually drooping on thread-like stalks; borne in rather short, loose racemes, on stems from 6 inches to nearly 2 feet tall. Leaves narrow with numerous shallow, toothed lobes. A hairy, somewhat sticky annual, often branched from the base, blooming from April to June, and frequent on dry, open slopes and hills, Central and Southern California, eastward to Utah and Arizona.

Your first sight of Whispering Bells may lead you to think this popular name more sentimental than true, for though the freshly opened flowers certainly simulate bells, they do not whisper. Found late in the season, however, the corollas are as dry as paper and rustle in every passing breeze, justifying the poetic appellative. The persistence of the flowers after fading is—with the yellow color—a character that distinguishes the genus Emmenanthe from the closely allied Phacelia. In fact the flowers have the property of Everlastings and may, as they, be employed for dry floral decoration. The name Emmenanthe is a Greekish way of saying—"the flower that abides."

WILD HELIOTROPE (*Phacèlia dístans*. Benth.). Flowers blue to whitish, nearly ½ inch across, wheel-shaped, stamens but slightly exserted; disposed in clustered coils unrolling gradually as the flowers expand. Leaves finely compound-dissected, a few inches long. A straggling, much branched annual, more or less hairy of leaf and stem, 1 to 3 feet tall, blooming from March to June, and common on dry mesas and hills and open, sandy places, from San Francisco to the Mexican border and eastward to Arizona, most common toward the Coast.

Very similar to *Phacelia distans*, and frequently mistaken for it, is *P. tanacètifolia*, Benth., the Tansy-leaved Phacelia. The flowers of the latter are conspicuous from their long-exserted stamens, and there is some difference in the seed vessels of the two species. The layman, however, is quite content to call both Wild Heliotrope, and to enjoy the delicate sheeted color which they sometimes spread over considerable areas of the dry, sunlit hills. Among Spanish-speaking Americans, the Wild Heliotrope is called Vervenia (*vair-ven-ee'a*), perhaps identical with *verbenilla*, a diminutive of Verbena.

LARGE-FLOWERED PHACELIA (*Phacèlia grandiflòra*, Gray). Flowers saucer-shaped and showy, from 1 to 2 inches in diameter, lavender or white, more or less veined with purple, in loose racemes. Leaves ovate tending to heart-shape at the base, 2 or 3 inches long, coarsely toothed. A robust, coarse plant 1 to 3 feet high, clothed with sticky hairs, and in consequence disagreeable to handle, communicating a reddish-brown stain to whatever it touches. Blooming in early summer on dry hillsides of Southern California.

The genus Phacelia, as at present understood, is a very numerous one, being a consolidation of some half-dozen genera that old-time botanists treated as separate. Of the 80 or so established species all are New World plants, and about 50 are indigenous to our Pacific Slope. The name is founded on a Greek word meaning "fascicle or cluster," an allusion to the densely crowded flower spikes of the first described species, *P. circinata*, Jacq. f., collected a century and a quarter ago in the Straits of Magellan—a species common also in California, and remarkable for its extended range.

WILD CANTERBURY BELL (*Phacèlia Whitlàvia*, Gray). Flowers blue-purple, an inch long or more, bell-shaped with roundish, spreading lobes, and long-exserted stamens, more or less pendulous in loose racemes. Leaves ovate, coarsely toothed, hairy. A loosely branching annual, somewhat viscid, and with a reddish stem about a foot high, blooming from March till early summer on dry hills, and in partially shaded foothill cañons up to about 3,000 feet, in Southern California.

This showy species is another California wild flower that has long been cultivated in gardens as an ornamental annual, and is sometimes known as California Bluebell, and California Bell-flower. The specific part of the botanical name is a survival of the plant's original christening, which was *Whitlavia grandiflora*, Harvey. It was introduced into Europe more than sixty years ago, and, it is said, has in some places there established itself as a wild flower. Cultivation has developed several varieties—among which one is a pure white, and another white with a blue centre. The plant is readily propagated from seeds.

YERBA SANTA (*Eriodictyon glutinòsum*, Benth.). Flowers lilac, purple or white, $\frac{1}{4}$ inch across or so, funnel-form, in coils of a terminal panicle. Leaves lanceolate, dark, shiny-green above, downy and netted-veined beneath, thick and resinous. A shrub 3 to 7 feet high, blooming May to July, on dry foothills and lower mountain slopes throughout California.

Yerba Santa is Spanish for "holy herb," and attests the value attached to it by the Spanish settlers in California. Its leaves are a famous remedy for colds, grippe, consumption and diseases of the blood, and are either made into a syrup with sugar or steeped in spirits. Among the Indians its use is immemorial. They not only made a tea of the dried leaves for fevers and "general misery," but to some extent they smoked them and chewed them like tobacco. The taste of the leaves is bitter and resinous at first, but later becomes rather pleasant.

This species insensibly passes into another, *E. tomentosum*, Benth., the leaves of which are densely clothed with a short white wool. They possess a tonic property similar to Yerba Santa.

BORAGE FAMILY

(*Boraginaceæ*)

Herbs or sometimes shrubs, chiefly rough-hairy; the gamopetalous flowers, as in the Waterleaf Family, borne in coiled clusters which straighten as the blossoms expand. Style usually single but sometimes 2-cleft, arising from a conspicuous 4-parted ovary becoming at maturity usually as many nutlets.

Fiddle Neck (*Amsinckia spectábilis*, F. & M.). Flowers yellow or orange, individually rather small but showy in the mass, borne in coiled spikes or racemes. Leaves alternate, narrow, very hairy. A slender annual a foot high or so, common on grassy mesas and open ground throughout much of California.

This species is hard to distinguish from two or three others that extend eastward across the deserts to Arizona. They often make considerable areas vivid with their massed flowers. Harsh as the plants are to the touch, they are much relished by cattle and in Arizona they are known by a Spanish term *sacate gordo*, which means "fat grass."

The resemblance of the flower stems with their tightly coiled spikes to fiddlenecks, accounts for the common English name.

POPCORN FLOWER (*Plágiobóthrys nothofúlvus*, Gray). Flowers bright white, small, in little fist-like coiled clusters at the summit of leafy stems a foot or so high. A bristly, hairy little plant with narrow leaves, many of them basal, blooming from February until May in grassy places from Southern California to Washington. The juice of the plant imparts a noticeable stain to one's fingers.

The Popcorn Flower is one of the most familiar of Pacific Coast spring flowers, and when growing in masses, one of the most striking in its effect. So thickly does it dot meadows and roadsides at times that the sight suggests a sprinkle of snow, whence a pretty Spanish name for it and its nearly related species—Nievitas (*nee-a-vee'tas*), meaning "snowflakes." Its relationship to the Forget-me-not of cultivation has given rise to another name, Wild Forget-me-not.

The disagreeable name Plagiobothrys is made up from two Greek words meaning "hollow at the side," an allusion to the pitted face of the nutlets at the point of attachment.

MINT FAMILY

(*Labiatæ*)

Herbs or shrubs, usually aromatic, with square stems and opposite leaves. Corolla mostly 2-lipped, the upper lip 2-lobed, the lower generally 3-lobed. Stamens sometimes 2, but typically 4, two shorter than the others. Style 2-cleft, rising from the midst of the 4-lobed ovary.

ROMÉRO (*Trichostéma lanàtum*, Benth.). Flowers blue, nearly an inch long, densely clothed with a violet wool, the calyces and buds pinkish-purple; the stamens (first coiled like a watch spring in the unopened corolla limb) conspicuously long exserted with threadlike filaments. Flowers borne in terminal interrupted clusters on shrubby stems 2 to 5 feet high. Leaves thickish, narrow, the margins turned under, shiny above and white-woolly beneath.

This showy shrub blooms from May to July on dry hills of Southern California, and from its foliage might be mistaken for Rosemary—which indeed is the meaning of its common name Roméro. It is a valued medicinal herb among the Spanish-Californians, a liniment being made of the leaves for bruises.

Turpentine Weed (*Trichostéma lanceolàtum*, Benth.). Flowers blue in dense, axillary clusters, becoming a one-sided raceme in age; stamens, as in *T. lanatum*, conspicuously exserted and curving. Leaves crowded, ashen-gray, lance-shaped from a broad base about an inch long, and strongly 3- to 5-ribbed, soft-hairy. A bushy annual, 1 to 2 feet high, blooming from August till October on dry valley lands and mesas throughout California to Oregon.

The feature of Turpentine Weed that identifies it most readily is a pronounced odor of turpentine, which it exhales. To some olfactories there is in the smell a suggestion of vinegar, whence the name Vinegar-weed current in some sections. The Indians made an infusion of the leaves for a headache remedy, but with them the plant's main use, according to Mr. Chesnut, was as a fish poison. The leaves were mashed in quantity and thrown into pools or streams, the effect being to stupefy the fish, which were then easily dipped out by hand or basket.

The word Trichostéma means "hair-like stamen," and was given because of the characteristic slender filaments. The curling habit of these accounts for the name, Blue Curls, applied generally to all species of the genus.

YERBA BUENA (*Micromèria Douglásii*, Benth.). Flowers white or purplish, about $\frac{1}{4}$ inch long, solitary on short stalks in the axils of the leaves, which are roundish or ovate and about an inch long. A low, creeping vine somewhat hairy, the slender stems from 1 to 4 feet long, and the whole plant pleasantly aromatic. Blooming in summer in woods of the Coast Ranges and in damp, half-shaded ravines from Southern California to British Columbia.

Yerba Buena (literally "good herb") is Spanish for the garden mint, but the name was also bestowed by the Californians upon this charming odoriferous little vine, of which they made a tea. This was used as a beverage, as a febrifuge, and as a remedy for colic, the value having been learned from the Indians. Its prevalence at one time on the western borders of San Francisco Bay gave name to the Spanish hamlet that came into being there in the latter part of the 18th century. This settlement continued to be called Yerba Buena until 1846, when the name was changed by the United States authorities to San Francisco. Such was the flowery beginning of the Pacific Coast metropolis.

Poléo Pennyroyal (*Monardélla lanceolàta*, Gray). Flowers rose or blue-purple, individually small, but showy in the mass in crowded terminal heads an inch or so across, subtended by purplish bracts. Leaves, few, narrow and tapering at both ends, 1 to 2 inches long. A branching, aromatic annual from 6 inches to 2 feet high, blooming from June to September throughout California, except in the higher mountains.

The pungent pennyroyal-like fragrance of this plant is a familiar one to the tramper upon the dry roads and hillsides of summer. Spanish-Californians call it Poléo, which is Spanish for pennyroyal, and use its leaves both as a household remedy and as a substitute for tea. Americans sometimes call it Mustang Mint.

There are several species of Monardella on the Coast, all pleasantly fragrant. One perennial species, *Monardella odoratíssima*, Benth, with pale foliage and dull-white flowers, is abundant on the dry slopes of the higher mountains of California (Yosemite region) northward to Washington, and eastward to Nevada and Utah. It is commonly called Mountain Pennyroyal, and tea of its leaves has some vogue among mountaineers as a blood purifier and colic cure.

PITCHER SAGE (*Sphàcele calycìna*, Ben h.). Flowers dull white or purplish, long bell-shaped about an inch in length, with 5 roundish lobes, one longer than the others; the loose-fitting, prominently veined, sharp-toothed calyx becoming inflated in age; flowers in axillary pairs, disposed in a loose, terminal, leafy raceme. Leaves 2 to 4 inches long, opposite, toothed, and wrinkled like those of the garden sage. A shrubby, branching plant, 2 to 5 feet high, rather hairy, and exhaling a sage-like odor. Blooming in spring and early summer on dry hills of Central and Southern California.

This is the only United States species of a genus that is principally South American. Our plant, however, is so variable as to have given rise to two or three named varieties, all confined to California, with distinctions hardly marked enough to interest the non-botanical. The flower is a fairly good imitation of a miniature pitcher, the prolongation of one of the corolla lobes simulating the lip of a pitcher, while the loose calyx in which the corolla sits may pass for the basin that is a well-regulated pitcher's natural concomitant.

White Sage (*Audibértia polystàchya*, Benth.). Flowers white or lavender, about ½ inch long, with a broad, ruffled lower lip, the style and the 2 widely separated stamens conspicuously protruding; disposed in an ample panicle a foot or more long. Leaves lanceolate-ovate, 2 or 3 inches long, these and the stems silvery gray with minute woolly hairs. A shrubby, aromatic perennial, from 3 to 6 feet tall, forming clumps and thickets on the arid hillsides of Southern California, blooming from April till July.

The White Sage is perhaps the most famous of bee-plants, the clear, pale honey produced from it being superfine. The Indians harvested the seed for grinding into meal, and also peeled the tops of the tender shoots for raw consumption. It is one of the numerous Western shrubs called Greasewood. To the arranger of wild-flower bouquets, the White Sage is invaluable, as its exquisite gray makes a harmonious combination with any color.

The genus Audibertia (the name commemorating an old-time Frenchman, one Audibert) is considered by some botanists as hardly enough different from Salvia to be separated from it. Others have discarded the name for another—Ramona.

Black Sage (*Audibértia stachyòides*, Benth.). Flowers bluish, lilac, or white, about ½ inch long, deeply 2-lipped, the 2 stamens little exserted, calyx teeth and bracts tipped with bristles; borne in dense interrupted whorls, along the slender stems. Leaves narrowish, wrinkled, dark green, 2 to 3 inches long, with a strong, sage-like odor. Plants shrubby, 3 to 6 feet high, abundant on dry hillsides of Central and Southern California, blooming from April to July.

Black Sage is almost of equal importance with its cousin the White Sage, as bee pasture. Entire sunny hillsides of the chaparral belt are sometimes covered with its thickets, which are a-hum throughout the spring and early summer with happy, winged harvesters of nectar. It is sometimes called Ball Sage. Among the Indians the tiny seeds were collected by being beaten with a fan into a gathering basket, and made an item of value in diet, after first being parched and then ground into a meal.

The specific name *stachyoides*, applied to this Audibertia, means "resembling Stachys," a genus of the Mint family, characterized by a similar form of inflorescence in separated whorls along the stems.

HOREHOUND (*Marrùbium vulgáre,* L.). Flowers small, white, crowded in dense clusters in the axils of the upper leaves; calyx with 10 short teeth turned back and these and the bracts becoming hooked at the tips. Leaves gray-green, roundish, with prominent veins and wrinkles. Perennial herbs with square white-woolly stems, in clumps a foot or two high. Blooming from March until July, along roadsides and in the neighborhood of settlements up and down the Pacific Coast.

Horehound is not indigenous to the Pacific Coast but is so sure to attract the plant collector's attention, that it deserves mention. It probably came into California with the American invasion, and from a root or two planted in some settler's garden for use as a household tonic and remedy for colds, it has spread amazingly. No introduced plant finds our Pacific Coast conditions more exactly to its liking than this. In the late summer and autumn when the seed vessels are mature, the plant is a good deal of a nuisance, as the tiny hooks on the calyces attach themselves to one's clothing, plastering it with myriads of the little nutlets.

THISTLE SAGE (*Salvia carduàcea*, Benth.). Flowers light blue or lavender, showy, an inch long, the divisions more or less fringed, the large lower lip fan-shaped and edged with white; stamens 2, long exserted; flowers disposed in many-flowered, woolly, globular head at the summit of stout, naked stems 1 to 2 feet high. Leaves gray green, spiny-toothed and thistle-like, with cobwebby wool, all basal. A winter annual, blooming from April to June on dry plains of the interior valleys and in sandy washes, abundant in Southern California.

The Thistle Sage is an exquisite example of what Nature can produce from apparently waste material, for often we find it springing from the midst of the most arid and unpromising of conditions. The California Indians in their practical way, found a use for its seeds, which though small, are full of nutrition, and after being ground, went into the aboriginal mush pot.

The name Thistle Sage is simply the English of the botanical appellation, and is perfectly descriptive. Miss Armstrong records another common name, Persian Prince, which is more romantic than obvious.

CHIA (*Sálvia Columbàriæ*, Benth). Flowers small, blue, little exceeding the spiny-toothed calyx, in interrupted whorls subtended by purplish, prickly, bracts. Leaves mostly basal, dull green, deeply cut into toothed, blunt lobes, coarsely wrinkled. A purplish-stemmed annual, from 4 inches to 2 feet tall, common on warm, dry hills throughout California and eastward to Nevada and Arizona. Blooming from March till May.

Chia (*chee'a*) is an odd-looking little plant, its flower heads like bristling buttons impaled on a skewer. The tiny seeds, rich in mucilage and oil, are famous as a staple food of the Pacific Coast and Mexican Indians from very ancient times, the plant having been a cultivated crop among the latter. The Indian method of harvesting the seeds is to beat the mature heads with a paddle over a flat basket. After winnowing, the seeds are parched over a fire and ground into meal, which may then be boiled up in water and eaten as a straight mush; or it may be mixed with wheat flour, and baked into cakes. A pleasant beverage may also be made from the crushed parched seeds steeped in water, with the addition of lemon and sugar.

BLADDER BUSH (*Salazària mexicana*, Torr.). Flowers about ¾ inch long, the upper lobe white or lilac, the spreading lower lobe deep blue or magenta; in loose terminal racemes. Calyx globular, enlarging remarkably in age and becoming like a blown-up bladder, ½ inch in diameter or more, yellowish or pink. Leaves grayish, scattering, and small, the floral ones reduced to little bracts. A shrubby, twiggy plant, 2 or 3 feet high, the slender, twisting branches soft-downy; blooming from March till May in the desert regions of Southern California, eastward to Nevada, Utah, and Arizona and southward into Mexico.

The genus Salazaria includes, so far as known, only this one species, which was brought to light during the work of the United States and Mexican Boundary Survey, shortly after our Mexican War, about three-quarters of a century ago. The showy flowers—the more noticeable because of the sparse foliage—and the pinkish bladdery calyces which succeed the flowers and adorn the bare branches like so many tiny balloons or paper lanterns, make a striking sight. The name Salazaria was given in honor of Don José Salazar, the Mexican Commissioner of the survey.

GIANT HYSSOP (*Lophánthus úrticifòlius*, Benth.). Flowers white or violet, the upper lip erect, the lower spreading, calyx with lavender teeth, the exserted stamens (4) with lavender anthers and white filaments; borne in crowded terminal spikes sometimes 6 inches long. Leaves 1 to 3 inches long, sweetish-aromatic, toothed, and nettle-like in look. An erect, coarse-looking, perennial herb, 3 to 5 feet high, blooming in summer, and abundant in mountain meadows usually at moderate altitudes of the Sierra Nevada in California, northward to Oregon and eastward to Nevada and Colorado.

Visitors in the Yosemite region cannot fail to notice the delicate color often given to meadow borders by the plantations of the Giant Hyssop. Its common name is an echo, I take it, of the plant's association by older botanists with the genus Hyssòpus, the leaves of which, under the name of Garden Hyssop, are still used medicinally by old-fashioned herbalists. It should not be confused with the Hyssop of Scripture, whose identity seems to be unsettled.

By some botanists the name Lophanthus has been discarded for Agástache, and by these our plant is listed as *Agástache úrticifolia*, O. Ktz.

NIGHTSHADE FAMILY

(*Solanaceæ*)

Herbs, shrubs or occasionally trees, usually rank-scented, with alternate leaves, no stipules and gamopetalous flowers usually 5-parted, stamens as many as the corolla lobes and inserted on the tube.

TOLUÁCHE (*Datùra metelòides*, DC.). Flowers fragrant, white, often tinged with violet, trumpet-shaped, 6 to 9 inches long and sometimes 6 inches across when fully expanded; calyx tubular, some 3 inches long, tipped with sharp teeth. Leaves dark green, coarse. A striking plant, 1 to 3 feet high, forming a clump, the showy flowers wilting after noon; blooming from May until October, throughout Southern California, east to Nevada, Utah, Arizona, and Texas, and into Mexico.

Toluache (*to'loo-ah'cha*) is the Indian name for this handsome Datura, which has played a notable part in aboriginal life because of its virulent, narcotic properties. An infusion of the leaves or root has the effect of producing hallucinations, stupefaction or frenzy, and it formerly was employed by medicine men in ceremonial rites. Its resemblance to the Eastern Jimson-weed (introduced about dwellings) is considerable.

BLACK NIGHTSHADE (*Solánum nigrum*, L.). Flowers white, little more than $\frac{1}{4}$ inch across, wheel-shaped, the anthers connivent like a yellow cone about the styles; borne in umbel-like, lateral clusters. Leaves dull green, ovate with a wedge-shaped base, 1 to 3 inches long. Fruit a pea-like berry becoming black when ripe. A much branched, spreading annual, 2 or 3 feet high, frequent everywhere, blooming at all seasons —a plant of cosmopolitan distribution.

On the Pacific Coast, the Black Nightshade is a common wayside plant of rather unsavory reputation, its berries and leaves being generally considered poisonous if eaten. The green fruit probably is so, but the fully ripe berries have been an article of diet with the Indians who appear to survive afterward. A nearly related species, apparently indigenous to California and Arizona, is *Solanum Douglasii*, Dunal, with rather larger white or violet flowers and often woody stems 3 to 5 or even 10 feet high. The juice of the berries was used by the San Diego Indians for inflamed eyes and for tattooing.

VIOLET NIGHTSHADE (*Solánum Xanti*, Gray). Flowers saucer-shaped, about an inch across, deep violet, with white-encircled green spots in the centre, and a cone of yellow anthers clasping the style; borne in lateral or terminal umbel-like clusters. Fruit a green or purplish berry about the size of a cherry. Leaves ovate, thinnish, an inch or two long, occasionally lobed at the base. A handsome perennial, shrubby at the base, 2 to 5 feet high, more or less clothed with sticky hairs. Blooming from April till June throughout California and into Nevada.

An examination of the hairs upon *Solanum Xanti* shows them to be jointed, a characteristic of importance to distinguish it from a nearly similar species *S. umbelliferum*, Esch., which is more woody and hoary with a pubescence of hairs that are not jointed but branched. *S. Xanti* by its queer specific name commemorates, in rather cryptic fashion, Mr. L. J. Xantus de Vesey of the Smithsonian Institution, who visited California about 60 years ago, and was one of the first collectors of this species. On Santa Catalina island a robust variety—*Wallacei*—is found with flowers 1½ inches in diameter.

TREE TOBACCO (*Nicotiána glauca*, Graham). Flowers greenish-yellow, tubular, $1\frac{1}{2}$ to 2 inches long, in loose panicles at the ends of branches. Leaves ample, ovate, bluish-green, very smooth with a "bloom." A straggling shrub or small tree from 6 to 20 feet high, sometimes forming thickets, abundant throughout Southern California in valleys and waste land eastward to Arizona and down into Mexico; blooming throughout much of the year.

The Tree Tobacco is a native of the Argentine, and found its way into the Pacific United States half a century ago nobody knows just how. Its dust-like seeds, borne on the wind, enable it to find a foothold in some surprising places, as high up on old Mission walls, or on mossy roofs. It is a real tobacco, as the botanic name indicates, and its dried leaves are sometimes used by the impecunious for smoking. By Mexicans it is called *tobaco*, or sometimes *Buena moza*, which means "a fine girl," a compliment to the unpretentious beauty of what most Americans consider a tree-weed. In Arizona it has been called San Juan Tree, for a reason not apparent.

FIGWORT FAMILY

(Scrophulariaceæ)

Herbs or shrubs with a 2-lipped corolla (sometimes obscurely so); stamens 2 or 4 (2 long and 2 short) or sometimes 5 with one sterile; style one, undivided.

California Bee Plant (*Scrophularia californica*, Cham.). Flowers dull red or greenish, $\frac{1}{4}$ to $\frac{1}{2}$ inch long, in a terminal panicle; stamens 4 in 2 pairs, with a rudimentary fifth stamen in the shape of a scale on the corolla throat. The upper lip of the globular corolla is 4 lobed and erect, the lower lip consisting of one lobe which is extended outward. Leaves opposite, ovate or triangular, 2 or 3 inches long, coarsely toothed. Blooming May until August (sometimes in midwinter), in rather moist ground throughout much of California at low or moderate altitudes, and eastward to Nevada—a coarse, branching plant with square stems, from 2 to 6 feet high.

The smallness of the flowers of the California Bee Plant may cause it to be overlooked entirely, but if noticed at all, they are sure to delight—alert little flowers with a grotesque, gnomelike sort of character that appeals to the imagination. As the name indicates they are famous honey producers.

BIRD-BEAK (*Cordylánthus filifòlius*, Nutt.). Flowers greenish yellow or purplish, $\frac{1}{2}$ to $\frac{3}{4}$ inch long, nearly hidden within the green calyx, corolla 2-lipped, the upper lip enclosing stamens and style; borne in many-flowered, terminal heads. Leaves alternate, divided into 3 to 5 threadlike divisions, the floral leaves and bracts more or less bristly on the margins and generally marked at the tip with a depressed gland or callosity. A loosely branched annual, roughish-hairy and often somewhat sticky below, 1 to 3 feet high, blooming from June to September in the hills throughout most of California.

The curious tip of the corolla, somewhat suggesting a bird's beak, is responsible for the common name of this species, whose grayish-green little bushes are often noticeably massed along mountain roadsides and in dry glades. The San Diego Indians found the plant medicinally serviceable as an emetic, according to the late Mr. P. S. Sparkman.

There are several species of Cordylanthus, all Far Western. In the Yosemite region, *C. tenuis*, Gray, is rather abundant, a slender annual, distinguished by very narrow leaves $\frac{1}{2}$ to 1 inch long without divisions.

CHINESE HOUSES (*Collínsia bìcolor*, Benth.). Flowers shaped somewhat like pea-blossoms, with a violet or rose-purple (sometimes white) lower lip, the upper lip white or lilac; disposed in a series of umbeled whorls, more or less one-sided, along the upper part of the stem. Leaves opposite without footstalks. A charming annual, 1 to 2 feet high, in moist ground throughout Western California from San Diego northward, blooming from April till June, often cultivated.

Collinsia is a North American genus which preserves in its name the memory of an excellent botanist of a century ago, Zaccheus Collins of Philadelphia. There are about 15 species, but none more lovely than *C. bicolor* ("the two-colored"), which is sometimes known as Innocence, a name as suggestive of the flower's spiritual quality, as is Chinese Houses of its outward make-up.

There is a closely allied species, *Collinsia tinctoria*, Hartweg, found in the Yosemite region, and characterized by a sticky brown or yellowish hairiness, which stains one's fingers. The flowers of this species have a yellowish throat with purple dots.

COULTER'S SNAPDRAGON (*Antirrhìnum Coulteriánum*, Benth). Flowers white, tinged with purple, the lower lip with its large palate forming most of the corolla, borne in a close spike 2 to 10 inches long. Leaves linear or oval, distant from one another. A stout, erect annual, 2 to 4 feet high, hairy above, and remarkable for producing from the leaf axils and the lower part of the flower spikes, long, threadlike, twisting branchlets which curl about adjacent shrubbery and by which the plant is disposed to climb. Blooming from May to July, on dry hillsides throughout Southern California.

This interesting plant is another to commemorate in its specific name that botanical pioneer of the Pacific Coast, Dr. Thomas Coulter. A slender branched variety, with purple flowers scattered along the stems, and the twisting branchlets often springing from the base of the flowers, has been considered worthy of specific distinction and is called *Antirrhìnum vàgans*, Gray—"the wandering"—an allusion to the branchlets twisting about for a support to grasp. It is common throughout Western California.

INDIAN PAINT BRUSH (*Castillèia foliolòsa*, H. & A.). Flowers red, $\frac{3}{4}$ inch long, tubular with a beak-like upper lip enclosing the style and 4 stamens, the corolla all but hidden within the bright red calyx; borne in terminal spikes with bright red 3-lobed bracts, the whole effect being that of a brush dipped in red paint. Leaves narrow, an inch long or so, crowded below and fascicled in the axils, these and the stems densely white woolly. A perennial with bunched, somewhat woody stems, a foot or two high, common on dry hills of Western California from San Diego northward; blooming March till July and sparingly at other seasons.

There are numerous Pacific Coast species of Indian Paintbrush, all easily recognized generically (the color sometimes varying to yellowish or white) though the specific differences are sometimes troublesome to the amateur. An interesting characteristic of the genus Castilleia (the name, by the way, commemorates the Spanish botanist, Castillejo) is the presence of suckers upon the roots, by means of which sustenance is extracted from the root systems of other plants—an instance of partial parasitism.

INDIAN WARRIOR (*Pediculàris densiflora*, Benth.). Flowers crimson (occasionally white) an inch long or so, 2-lipped, the upper much the more conspicuous, compressed at the sides and arched above; borne in dense terminal spikes, becoming larger and looser in age, mingled with purplish bracts. Leaves finely dissected, feather-like, many basal; dark red when young, becoming green in age. A stout perennial, common in open hillside forest from Central California to Oregon, blooming in the spring.

According to Mr. Chesnut the Yuki Indian name for this Pedicularis is the same as their word for Yellow-hammer—*wai-mok'*—a bird that frequents the flowers for their abundant nectar. Children, too, have discovered the plant's sweet secret and such the blooms as they do honeysuckle blossoms.

In meadows of the Yosemite region and the High Sierra two kindred species are met with—*Pedicularis attollens*, Gray, and *P. groenlandica*, Retz., in which the pinkish, hooded, upper lip ends in a curved or abruptly upturned beak. The resemblance to an elephant's head and trunk has suggested the common name Elephant-heads for both these species. The likeness is more noticeable in *P. groenlandica*.

Owl's Clover (*Orthocárpus purpuráscens*, Benth.). Flowers 2 lipped, the narrow, straight, upper lip crimson, the lower inflated, in the form of a sac, creamy white at the centre deepening outwardly to magenta; disposed in dense spikes with bracts, these and the calyx lobes with purplish tips. Leaves divided into many thread-like lobes. An erect, hairy annual, common throughout California, blooming from March to May in grasslands and on hillsides, often tinging the landscape for considerable distances with a purple bluish.

The general appearance of Owl's Clover simulates a Castilleia of dull color. For this reason the name Pink Paint-brush is sometimes applied to it—unfortunately, as the practice tends to confuse two quite separate genera. Why it should be called Owl's Clover is not obvious. Perhaps, it is because, as Miss Armstrong suggests, the quaint flower-faces of some species are of owlish look. The Spanish-Californian's name is Escobita, meaning "little broom," which is really descriptive.

There are numerous species of Orthocarpus, some with spikes that are white, and some that are yellowish. One of the latter, *O. lithospermoides*, Benth., has been graphically called Coyote-tail by Northern California Indian children.

BUTTER AND EGGS (*Orthocárpus eriánthus*, Benth.). Flowers about an inch long, 2-lipped; the slender, straight upper lip (which is slightly hooked at the tip) brownish-purple; the lower lip inflated in the form of 3 conspicuous puffed-up sacs which are deep sulphur yellow; the slender tube of the flower white, and thrice the length of the calyx; borne in a many-flowered, rather dense spike with pinnately divided bracts that are more or less purplish. Leaves pinnately parted above a broad base into thread-like divisions. A slender much-branched annual with reddish stems, 4 to 10 inches tall, blooming in the spring, from Central California northward to Oregon, common on low grounds near the Coast.

People who object to the prosy name of Butter-and-eggs for this pretty flower (suggested by the mixture of white and yellow in its composition) may prefer Johnny Tuck, another popular appellative. The elfin look of the blossoms of the more showy species of Orthocarpus seems to challenge the fancy to provide them with affectionate nick-names.

Scarlet Monkey Flower (*Mímulus cardinális*, Dougl.). Flowers scarlet, about 2 inches long, corolla 2-lipped, upper lip erect, its lobe and the lower lip turned back; stamens (4) long exserted; flowers borne on upright peduncles about 3 inches long, from the axils of the upper leaves. Leaves ovate or lanceolate, opposite, without footstalks. A stout, branching perennial herb, hairy and sticky, 2 to 4 feet high, blooming from June to October, in swampy ground or along watercourses throughout California and Oregon, and eastward to Arizona.

The Scarlet Monkey Flower was one of the discoveries of David Douglas, who in the 1830's sent the seeds to England from the Pacific Coast. The splendid flowers proved a noteworthy novelty to florists, as no Mimulus of just this color had been known until that time. It has continued to be a favorite in cultivation. In its native haunts, it is one of the most striking of wild flowers, and visitors to the Yosemite Valley, as well as the Grand Cañon of Arizona, are pretty sure to be greeted with a sight of it—its unrivaled flowers glowing brightly against the green background of the streambanks and *ciénagas* where it delights to dwell.

YELLOW MONKEY FLOWER (*Mímulus lùteus*, L.). Flowers bright yellow, often dark-dotted within, corolla 2-lipped, an inch or two long, the prominent base of the lower lip often blotched with brown; borne in a loose, terminal raceme. Leaves opposite, roundish, sharp-toothed, an inch long or so, the upper closely sessile. A small, leafy plant of very variable habit, annual or perennial, from less than a foot to sometimes 4 feet high, spreading by slender, creeping stems. Blooming from April till August in wet places and on stream banks throughout California northward to Alaska, and eastward to the Rocky Mountains.

There are many yellow flowered species of Monkey Flower, but the frequency of *Mimulus luteus* over a wide territory of the Pacific Coast, seems to entitle it to being called *the* Yellow Monkey Flower. A common yellow species of Southern California, blooming from April to June upon dryish hillsides, is *Mimulus brevipes*, Benth.—a sticky-hairy little annual a foot or two high, with narrow, opposite leaves. The flowers are borne on very short footstalks.

Sticky Monkey Flower (*Mímulus glutinòsus*, Wendl.). Flowers showy, usually buff or salmon-color, sometimes reddish or even crimson, funnel-form with spreading lobes ragged edged, and somewhat suggesting azaleas, borne on short footstalks in the leaf axils. Leaves narrow, opposite, 1 to 4 inches long, evergreen and glutinous. A shrub 2 to 6 feet high. Common throughout California from San Francisco southward on hills and rocky banks, blooming from April till July and sparingly at other seasons.

The shrubby character of this Mimulus puts it in a class to itself as other species of this large and interesting genus are herbaceous. On this account, mainly, it has been given generic distinction by some botanists as *Díplacus glutinosus*. It runs into many varieties, one of which, var. *linearis*, is marked by exceedingly narrow, rather stiff leaves, and flowers of a rich crimson, though oddly enough one may find sometimes on the same plant the buff blossoms of the type. The Sticky Monkey Flower is very ornamental and is one of several species that have been introduced into cultivation. It has a place in some conservatories.

Crimson Monkey Flower (*Mímulus Bigelòvii*, Gray). Flowers about an inch long, crimson, with a yellow centre, corolla funnel-form, the cylindrical tube expanded into a wheel-shaped limb about ½ inch in diameter; disposed mostly in a terminal cluster. Leaves opposite, oblong, or ovate nearly an inch long. A sticky-hairy annual, 3 or 4 inches tall, of sandy places, Southern California and eastward in the desert to Nevada and Utah, blooming in the spring.

This charming little plant was first collected by Dr. John M. Bigelow, botanist of the Whipple Pacific R. R. Survey. It was given its specific name in honor of him, but assigned to the genus Eunànus. This genus, however, is now generally disregarded and its dozen or so species are considered as a section of Mimulus. All are beautiful little annuals of California and adjacent territory, the corollas purple, crimson, or occasionally yellow, mostly with a rather slender tube, and the anthers of the 4 stamens set closely together so as to form crosses.

Mímulus Douglasii, Gray, is a species frequently met with throughout California on gravelly banks. Its crimson flowers have a narrow tube an inch or more long, in the early state much longer than the plant is high.

Musk (*Mímulus moschàtus*, Dougl.). Flowers light yellow, brownish in the throat, 2-lipped, ½ inch to an inch long, much exceeding the calyx; usually borne in pairs on slender footstalks from the upper leaf-axils. Leaves light green, opposite, ovate, an inch or two long, the basal crowded. A white-hairy, sticky, often slimy plant, musk-scented, ½ to 1½ feet high, spreading by creeping perennial rootstalks; common in damp, shady places, particularly along brooks from California to British Columbia and eastward to Utah. Blooming in spring and summer. In California and Oregon the form usually found is var. *longiflorus*, distinguished by the elongated corolla, often an inch long, 3 times the length of the calyx, and flower stalks exceeding the leaves.

This is the well-known Musk plant of old-fashioned gardens, collected by David Douglas in Oregon in 1826, and by him introduced to the world.

An interesting feature of the various species of Mimulus is the pistil. The stigma is composed of two flat plates, spread apart when the flower is mature. These are sensitive and close when touched, as on the visit of an insect, and are supposed to play a part in cross-fertilization.

BLUE BEARD-TONGUE (*Penstèmon spectábilis*, Thurber.) Flowers very showy, funnel-form, somewhat inflated at the throat, and somewhat 2-lipped, an inch long, rose-purple or lilac, the corolla limb blue or violet; on slender footstalks disposed in loose, leafless, terminal, pyramidal panicles sometimes 3 feet long. Leaves opposite, pale green, ovate, rather leathery, with spiny teeth, the upper pairs joined at their broad bases and clasping the stem as though pierced by it. A stately, handsome, herbaceous perennial, from 3 to 6 feet high and sometimes even taller, found on dry hillsides and plains of Southern California, thence eastward to Arizona and New Mexico; blooming from March till June.

The genus Penstemon is a very large one of North America and Mexico, and is represented on the Pacific Coast and contiguous territory by at least 50 species and recognized varieties, many of them with flowers of great beauty, which have been introduced into gardens. A characteristic of the flowers is that of the 5 stamens only 4 are provided with anthers, the fifth being sterile but with a conspicuous filament. This in some cases is bearded, whence the common name, Beard tongue, though it is probably less used in popular speech than the botanical name.

VIOLET BEARD-TONGUE (*Penstèmon heterophỳllus*, Lindl.). Flowers funnel-formed, somewhat inflated on one side, 2-lipped an inch long or more, rose-pink sometimes changing to or suffused with violet, the buds frequently yellowish; disposed in a narrow bracted panicle terminal on the stems and branches. Leaves opposite, very narrow or lance-shaped. A slender, many-stemmed, smooth perennial, 2 to 5 feet high, woody at the base; common along roadsides and on dry hillsides of Central and Southern California, blooming in the spring and early summer.

The specific name *heterophỳllus* given to this beautiful species means "having different kinds of leaves on the same plant."

Another species *Penstèmon azùreus*, Benth., is very like it and found in similar situations, though commoner northward. It may be known by its rather large flowers—an inch across—of azure blue, and the glaucous character of the foliage. It is very variable, however, the variety *angustissimus*, with very narrow leaves, being found in the Yosemite Valley. In both species the anthers are an interesting sight under a glass, resembling minute horseshoes, fringed along the edges.

YELLOW BEARD-TONGUE (*Penstèmon antirrhinòides*, Benth.). Flowers lemon-yellow, showy, the corolla 2-lipped, arched above and widely gaping, an inch long or less, the one sterile stamen densely bearded on one side; on short one-flowered footstalks in leafy panicles. Leaves scarcely half an inch long, narrowly oval. A much-branched, shrubby perennial 3 to 5 feet high, blooming in spring on dry hillsides of Southern California.

The specific name of this Penstemon means "like an Antirrhinum," the Snapdragon, the large-lipped corolla with its swelling throat suggesting a resemblance, less apparent I think, to the collector in the field than it seems to have been to the describer in his armchair in England.

Another Penstemon, with yellowish flowers in shape suggesting those of the Yellow Beard-Tongue is *P. breviflorus*, Lindl., which occurs in rocky places of the Yosemite region and along the flanks of the Sierra Nevada. The yellowish corolla is tinged with flesh color, striped inside with pink, the arched upper lip hairy, but the sterile filament is without beard. Doctor Hall states that the tough stems of this species are used by the Indians in the making of storage baskets.

Scarlet Bugler (*Penstèmon centranthifòlius*, Benth.). Flowers bright scarlet, tubular, an inch long or more, borne in showy, narrow panicles a foot or even 2 feet long. Leaves opposite, thick, and mostly without footstalks, the upper clasping the stem by their heart-shaped bases. A stout, smooth perennial, 2 to 4 feet high, stems and bluish-green foliage covered with a dense "bloom." Common in open ground, on dry hillsides and on mountain slopes from Monterey southward in California and eastward to Arizona, flowering from February till June.

The slender flowers of the Scarlet Bugler suggest the trumpets of the Coral Honeysuckle, and tempt people with limited botanical knowledge to call them honeysuckle. They make a blaze of color in the mountains in spring and early summer, and few flowers are better known. Bees are their persistent visitors, and also humming birds—whence another common name sometimes heard, Humming-bird's Dinner Horn. In the Sierra Nevada, including the Yosemite region, another scarlet-flowered species somewhat resembling this is found—*Penstèmon Bridgesii*, Gray. The corolla of this is distinctly 2-lipped, and the plant is not glaucous.

SCARLET HONEYSUCKLE (*Penstèmon cordifòlius*, Benth.). Flowers scarlet, the narrow, tubular corolla about $1\frac{1}{2}$ inches long, 2-lipped, the upper lip erect, the stamens and pistil conspicuous in the extended lower lip; flowers borne in short, leafy, terminal panicles. Leaves roundish, heart-shaped, toothed, an inch long or so, dark green and of somewhat leathery texture. A vine-like perennial, rather woody, 6 or 8 feet high, clambering over shrubs in Southern California; blooming from May to July.

It is a misnomer to call this Penstemon honeysuckle, which is of quite another family, but the general look of the flower and the habit of the plant lend color to the popular name. The aspect of the foliage, however, is more suggestive of the cultivated Fuchsia than of Honeysuckle. It is a frequent plant in the chaparral belt of southern California mountains and its showy flowers, nodding from the tips of the gracefully drooping branches, are a familiar sight to travelers over the hill trails.

A species that somewhat resembles this is *Penstèmon ternàtus*, Torr., growing in similar situations. The wand-like flowering shoots of this are glaucous, and the stiff, narrow leaves are whorled in 3's above.

MULLEIN (*Verbáscum virgàtum*, Withering). Flowers yellow, corolla flat, wheel-shaped with hardly any tube, stamens 5, all perfect, bearded with violet woolly hairs; borne in a slender terminal raceme, the short footstalks usually in 2's and 3's. Leaves oblong, somewhat toothed, without footstalks, alternate. A slender, erect, somewhat sticky-hairy plant, 4 to 6 feet high, blooming in summer in valley-lands and along roads in California.

This so closely resembles the common Moth-mullein which is a weed in Eastern fields, that it might be mistaken for a tall form of the latter. Like this, also, it is an emigrant from Europe, but in its distribution in the United States, seems confined to the Pacific Coast. It has doubtless reached us by way of Mexico, in the days of the Spanish or Mexican occupation. If it were not for the association of the genus in the American mind with weeds, the graceful beauty of these plants would be more appreciated. The two common naturalized species of the Atlantic slope have also found their way of late years to California, and are now more or less abundant in the Sacramento Valley.

MOHAVEA (*Mohàvea víscida*, Gray). Flowers pale yellow, purple-dotted, somewhat bell-shaped, $1\frac{1}{2}$ inches long, the base swollen on one side, corolla of 2 fan-like lips, the upper 2-lobed, the lower 3-lobed with a prominent palate bearded down the middle; stamens 4, 2 of them fertile and 2 reduced to small, abortive filaments, disposed in short, terminal, few-flowered racemes. Leaves narrow, an inch or two long, the lower opposite, the upper alternate. An erect, sticky-hairy annual, from a few inches to 2 feet high, flowering from March till May in the desert regions of Southeastern California and of Arizona.

Mohàvea is one of those flowers which surprise the visitor in the desert with an exquisite delicacy born of the most desolate conditions—a pallid, ethereal blossom of silken texture and a sort of orchid-like aspect. The honor of its discovery in complete flower is due to John C. Fremont, in 1844, though imperfect specimens had been collected some years before by Dr. Thomas Coulter, a pioneer collector on the desert. Fremont's plants were gathered on the banks of the Mohave River, Calinia, and the name Mohavea commemorates the fact.

BROOMRAPE FAMILY

(Orobanchaceæ)

Parasitic plants on the roots of others, whitish, yellowish, or brownish, never green, with alternate scales in place of leaves. Flowers solitary, axillary.

CANCER ROOT (*Aphyllon fasciculàtum*, Gray). Flowers yellowish or brownish, corolla 2-lipped, with an elongated somewhat curved tube, about ¾ inch in length; solitary on bunched, long footstalks rising from the axils of the scales. Stem densely sticky-hairy, a few inches tall, parasitic on other plant-roots, in sandy ground California to British Columbia, and eastward through Arizona to the Mississippi Valley.

The name Cancer Root has been popularly applied to several plants of the Broomrape family because of their fancied efficacy in cancerous diseases. There are half a dozen species of Aphyllon indigenous to the Pacific Coast, several of which have their flowers in dense racemes or spikes. One of these—*Aphýllon tuberosum*, Gray—of Southern California has a thickened tuber-like base, which the Indians roasted and ate.

By some botanists the plants of this genus are included in the genus Orobanche.

ACANTHUS FAMILY

(*Acanthaceæ*)

Herbs or shrubs with opposite, simple leaves, more or less 2-lipped or irregular flowers with usually conspicuous bracts, and the general character of the Figworts; stamens 4 (2 long and 2 short), or only 2; calyx persistent, of usually 5 unequal sepals.

CHUPAROSA (*Belopérone californica*, Benth.). Flowers dull scarlet, tubular, about an inch long, 2-lipped, stamens 2; borne in short, rather loose racemes terminating the branches, which are often leafless. Leaves, when present, small, ovate, or oval, grayish green. A low shrub, forming a clump of ashen-gray, downy, interlacing branches, indigenous to the desert regions of Southern California and Arizona, southward to Mexico; flowering in the spring. One of the most striking of desert flowers, when the leafless and apparently lifeless tangle of branches is adorned with the numerous bright corollas, like so many tongues of flame. The blossoms may be easily mistaken by the careless for Penstemon, and sometimes are. Mexicans call the plant Chuparosa, which may be translated Humming-bird Flower—the hummers feeding on its sweets.

HONEYSUCKLE FAMILY

(*Caprifoliaceæ*)

Shrubby plants, often vines, with opposite leaves, the regular and irregular flowers gamopetalous, and commonly in parts of 5.

ELDER (*Sambùcus glauca*, Nutt.). Flowers white, small, in large, flat-topped, compound clusters; leaves opposite, compound with smooth leaflets, deciduous; berries blue with a dense mealy-white "bloom." Usually a tree 15 to 20 feet tall, but sometimes attaining a height of 30 or even 40 feet; blooming April till June on moist hillsides and in cañon bottoms from Southern California to British Columbia, eastward to Idaho, Nevada, and Utah.

The berries of this Pacific Coast Elder are used for pies and jellies. The Indians not only ate the fruit, but from the dried blossoms made a tea for fevers and digestive troubles, as well as a wash for sprains and the itch. The wood, after the pith was pushed out, was turned into whistles and flutes, or split and fashioned into clappers for dancers. Bows were also made from it.

S. Mexicana, Presl., occurs in parts of California and Arizona, the leaves downy and the berries without "bloom."

GOURD FAMILY

(*Cucurbitaceæ*)

Herbaceous vines usually with tendrils. Leaves alternate, generally more or less lobed. Petals usually 5, often more or less united; flowers of 2 sexes, on the same or different plants. Stamens usually 3, one of them with a 1-celled anther, and the filaments often united.

Mock Orange (*Cucúrbita foetidíssima*, HBK.). Flowers large, yellow, bell-shaped with 5 recurving lobes, of 2 sexes on the same vine, solitary on axillary footstalks 1 or 2 inches long. Leaves rough, somewhat triangular, with heart-shaped base and slightly 3 to 5-lobed. A rough, hairy, prostrate vine, ill-smelling when disturbed, from a large perennial root, blooming from April to July or later, in dry soil, California (especially southern) eastward to Nebraska and Texas and south into Mexico.

The name Mock Orange, commonly applied to this gourd, describes the mature fruit. They are of saponaceous composition and the Indians crushed them for soap. They also used the seeds for food. The plant is nearly related to the pumpkin.

Big Root (*Echinocýstis fabàcea*, Naudin). Flowers yellowish-white, wheel-shaped, about ½ inch across, of 2 sexes in the same plant, the staminate in axillary racemes at the base of which a solitary pistillate flower is usually borne on a footstalk. Leaves palmate, about 5-lobed. A graceful vine, sometimes 25 or 30 feet long, clambering over bushes, growing rapidly in the spring from a huge root, Southern and Central California, blooming February to May.

The remarkable root of this common plant is as big often as a man's body. Seen exposed at the surface of the ground it might be mistaken for a jutting rock, but for the vine stems rising from it. The curious prickly burs or seed vessels contain a few large, smooth seeds which have long served California children as playthings. Another purpose to which they were put by Spanish-Californians was to make necklaces of them—the meat first having been extracted through small holes cut in the shell. They called the plant Chilicothe—a form apparently of the Aztec *chilacoyote*, wild cucumber.

The nomenclature of the genus is much confused. Some botanists call it Micrámpelis, others Megarrhìza.

BELL FLOWER FAMILY

(*Campanulaceæ*)

Herbs with alternate leaves, usually with milky juice, and regular 5-divided gamopetalous flowers, the corolla usually withering instead of dropping; stamens 5; style hairy with a stigma of 2 to 5 lobes, at first shut together. The anthers expand while the flower is still in bud and discharge their pollen against the hairy style. The stigma matures later after the flower opens; it then expands for the reception of pollen brought by insects from other flowers.

California Harebell (*Campánula prenanthòides*, Durand). Flowers blue, about ½ inch long, bell-shaped, divided into 5 slender, recurving lobes, stamens and the longer pistil much exserted; scattered or clustered in terminal racemes. Leaves lanceolate to ovate, sharply toothed, about 1 inch long.

The California Harebell is a perennial with rather stiff, clustered stems, a foot or two high, blooming in summer, in moist, shady places of the redwood forests of California, and in foothills of the Sierra Nevada. The seed vessels of this genus have 3 or 4 round porthole-like valves on the side, which open up for the discharge of the seeds.

LOBELIA FAMILY

(*Lobeliaceæ*)

Herbs with milky juice, alternate leaves, and irregular flowers, apparently 2-lipped; stamens 5, united into a tube by their filaments or the anthers cohering into a ring about the top of the style, which is single and surmounted by a usually 2-lobed stigma encircled with hairs. (A family united by some botanists with Campanulaceæ, into which it seems to pass.)

WESTERN CARDINAL FLOWER (*Lobèlia splendens*, Willd.). Flowers flaming red, 2-lipped; the corolla tube about an inch long, split down the upper side, the lower lip 3-parted and spreading, the upper 2-cleft and erect; borne in showy, wand-like racemes at the summit of slender, smoothish stems 2 to 4 feet high. Leaves without petioles, lance-shaped to linear, with gland-tipped teeth. Blooming in summer and early autumn in wet grounds, Southern California eastward to Arizona and New Mexico, thence south to Mexico.

This glorious flower is so nearly a duplicate of the well-known Eastern Cardinal Flower, that one knowing the latter easily recognizes this. It is slenderer and smoother than the Eastern, and the leaves narrower.

SUNFLOWER FAMILY

(*Compositæ*)

Herbs, shrubs, or even trees; flowers numerous in a dense head on a common receptacle, which is the enlarged top of the peduncle, and surrounded by a circle of bracts called the involucre. Corolla either tubular, or the limb prolonged into a strap, toothed at the summit. In some cases both sorts of flowers are present in the head—the tubular occupying the centre and called "disk flowers," the strap-shaped occupying the margin and called "ray flowers." Calyx tube united with the seed-vessels (achenes), often continued into a ring of bristles, hairs, or scales known collectively as a "pappus."

ENCELIA (*Encèlia californica*, Nutt.). Flower heads showy with golden-yellow rays and brownish-purple disks, solitary on long, naked peduncles. Leaves short petioled, mostly alternate, broadly lance-shaped, about 2 inches long, green both sides and prominently 3-nerved from the base. A bushy perennial common on dry hillsides, Southern California eastward to Arizona, blooming more or less at all seasons. A showy sunflower-like blossom.

INCIENSO. INCENSE PLANT (*Encèlia farinosa*, Gray). Flower heads yellow, both ray and disk, the heads somewhat clustered at the tips of numerous nearly leafless branches, rising above the compact plant. Leaves ovate, narrowed to a rather long footstalk, silvery white with a dense scurfy wool. A woody perennial, forming a round-topped bush 2 to 5 feet high, with usually a stout, trunk-like stem; blooming in spring on dry hills and mesas in Southeastern California, throughout the deserts to Arizona and southward to Mexico.

This is one of the commonest of desert under-shrubs, and a close look at it shows its stem and branches exuding globules of resinous gum. This plays a considerable part in the human life of the desert. In Lower California it has been burned as incense in the churches (whence the name Incienso); Indian children use it as chewing gum; and their fathers make a varnish of it. According to Mr. Karl S. Lumholtz ("New Trails in Mexico") Mexicans warm the gum and smear it on the left side of the body below the ribs for pain there. On this account the plant is sometimes called Yerba del Vaso, "waist herb."

SUNSHINE. DESERT SUNFLOWER (*Encèlia eriocéphala*, Gray). Flower heads golden yellow, about 1½ inches in diameter, the base and margins of the green involucral bracts conspicuously white with long hairs; heads single or panicled at the tips of the stems. Leaves ovate or lance-shaped, 1 to 3 inches long, alternate, most abundant toward the base of the plant, which is a rather hairy, herbaceous annual from a few inches to 2 feet high, or sometimes higher. Blooming in spring in the sands of the California desert region, eastward to Nevada and Arizona.

Even the most hurried travelers in spring across the open desert by train or motor car can hardly fail to be attracted by the sight of this charming flower. Its blossoms of lively yellow in favorable seasons make sheets of solid color over the wastes, quite justifying the pretty common name Sunshine applied to it in some localities. The botanical name for the genus was given in honor of an old-time botanist, Christopher Encel. There is a doubt with some botanists about the propriety of including this species Sunshine in Encelia, and by such it is called *Geràea canescens*, T. & G.

WILD SUNFLOWER (*Heliánthus ánnuus*, L.). Flower heads 3 to 5 inches across, with yellow rays and purple-brown disks, borne singly at the branch ends; involucral bracts abruptly narrowing to a slender point. Leaves 3 to 10 inches long, mostly alternate and toothed, ovate, 3-ribbed from the base, rough-hairy. A coarse, erect, branching annual, with rough, often mottled stems, from 2 to 10 feet high, by roadsides and on plains—California to Washington, eastward to the Missouri River. Blooming mostly in the autumn, but on the Pacific Coast flowering almost all the year, often covering great areas with gay bloom.

The giant sunflower of gardens is a development from this wild species, which from time immemorial has been a valuable plant in the aboriginal economy. Indians from Canada to Mexico cultivated wild sunflower as a crop, the seeds being parched and ground into a meal which for nutrition and palatability is said to be almost equal to cornmeal. The seeds also yield an oil, which the aborigines used both dietetically and as an ointment. The large, coarse stalks yield a utilizable fibre, and from the flowers a good dye has been made.

TIDY-TIPS (*Làyia platyglóssa*, Gray). Flower heads about an inch in diameter, ray flowers yellow, usually tipped with white, the disk flowers yellow with black anthers; borne singly at the tips of the stems. Leaves alternate, narrow, without footstalks, more or less toothed and hairy, some of the upper deeply cut. Simple or branching, hairy annuals, 1 to 3 feet high, blooming from April till June, in valleys and on sunny mesas throughout western and southern California.

The common name most appropriately describes this neat little wilding, which captivates all hearts. There is considerable variation in the flower, the white tips being sometimes absent or occasionally turned to purple. There is another Layia, common from Santa Barbara southward into Lower California, which may be confused with Tidy-tips, and that is *Làyia élegans*, T. & G. The rays, however, are more usually altogether yellow than white-tipped. An essential difference, however, is in the character of the pappus. This in Tidy-tips consists of awn-like bristles, which are naked their whole length, while in *Layia elegans* the bristles below the middle are feathered or white-hairy.

WHITE DAISY (*Làyia glandulòsa*, H. & A.). Flower heads very showy, 2 inches or so in diameter, with rays of pure, clear white, the disk yellow; terminating the branches. Leaves narrow, without footstalks, grayish green, rough-hairy and somewhat sticky, especially above, from the presence of little, blackish, stalked glands. Blooming from April till June, common from Southern California to British Columbia, and eastward to Idaho and New Mexico. A usually much-branched, roughish plant from a few inches to 2 feet high, affecting sandy soil.

This lovely Layia deserves a more distinctive common name than White Daisy, which is rather inept. As the botanical name for the genus is easy of pronunciation and euphonious, it would be well enough to call the plant White Layia. Layia, by the way, is in memory of G. Tradescant Lay, naturalist of the Beechey Exploring Expedition which visited the Pacific Coast in 1827. The plant is not entirely constant in the whiteness of its rays. Sometimes these are rose-purple. In fact, specimens have been collected with both white rays and purple on the same plant. The San Diego Indians used the seeds for food.

Seaside Daisy. Beach Aster (*Erígeron glaucus*, Ker.). Flower heads a couple of inches across or more, disk florets yellow, rays violet or lilac, narrow, exceedingly numerous (sometimes 100 or more) in several rows; borne singly at the tips of ascending stems 4 inches to a foot high. Leaves alternate, mostly clustered at the base forming a crown to a fleshy rootstalk, pale green and succulent, the largest 3 or 4 inches long and 1 inch wide, those of the stem small and few. A perennial plant common along the coast within the influence of the ocean, from Oregon to the Santa Barbara Channel Islands, flowering throughout most of the year.

The Seaside Daisy, or Beach Aster, is one of the noticeable wild flowers on seaside downs, especially from Monterey northward, and its resemblance to the single, bluish-flowered China Asters of gardens is marked enough to make it of easy recognition. The genus Erigeron is, indeed, exceedingly near to Aster, the distinguishing characters being mostly of technical importance only. To the amateur the feature of Erigeron that is most striking is the narrowness and great number of the rays, which, moreover, are arranged usually in several rows.

MALACOTHRIX (*Malacòthrix californica*, DC.). Flower heads pale yellow, showy, about 2 inches across, composed entirely of strap-shaped ray flowers (like the dandelion); solitary and terminating usually naked stalks 6 inches to a foot high, nodding in the bud. Leaves tufted at the base of the flower stalk, cut into narrow linear divisions, which when young are clothed with loose, long, soft hairs. An herbaceous annual, blooming from March till May, in sandy soil of the California Coast region from San Diego to San Francisco, and on plains of the interior valleys.

This is a charming flower, the large heads resembling the bloom of the Hawkweed, and of a delicate tone of yellow fused with cream, and often with a purplish tone at the centre. In the California desert region and eastward to Nevada and Arizona, and northward to Oregon, there is a variety *glabrata* quite common, which is devoid of hairiness, and usually with flower heads borne laterally on the flowering stem as well as at the top. Some botanists consider this a separate species, *M. glabrata*, Gray. Malacothrix means "soft hair," an allusion to the woolliness of the young plant.

YELLOW DAISY. DOUGLAS COREOPSIS (*Leptósyne Douglásii*, DC.). Flower heads showy, 1 to 1½ inches across, both disk and ray florets, bright yellow, borne singly at the summit of a naked stalk. Involucral bracts in 2 series, the inner 8 to 12, erect and broad; the outer fewer, narrower, loose, and leaf-like. Leaves mostly basal, divided into a few thread-like divisions. An herbaceous annual, a few inches to a foot high, blooming from March till summer on dry plains and foot-hills, Southern California and eastward to Arizona. Rather variable, being much reduced in size when growing amid brush, while along the seashore leaves and stems are thickish, and the flower heads larger.

The Yellow Daisy was one of David Douglas's discoveries, which accounts for his name being linked with it. It is a flower of peculiar attractiveness because of the clear, sunshiny quality of its yellow. Its general appearance suggests a garden Coreopsis, and some botanists, indeed, class it as *Coreopsis Douglasii*. The characteristic feature of the genus Leptosyne is the presence of a thickened ring (sometimes hairy) around the tube of the disk corollas. This may be readily seen under a pocket lens.

Sea Dahlia (*Leptósyne marítima*, Gray). Flower heads showy, 3 or 4 inches across, with both ray and disk florets and both kinds yellow; solitary, topping naked flower stalks 6 inches long or more. Leaves alternate, fleshy, 2 or 3 times divided into narrow linear lobes. A striking, much-branched, herbaceous perennial with a stout base, 1 to $2\frac{1}{2}$ feet high, blooming in spring and summer, along the Southern California coast near San Diego, in Lower California, and on the adjacent islands.

The resemblance of this showy flower to a single Yellow Dahlia has suggested the common name. Both the beauty of the blossom and the striking appearance of the coarse lace-like foliage have gained for it a place in gardens, and its complaisance as a cut flower gives it an additional value in cultivation.

Also along the coast of Southern California and upon the islands near by one comes upon *Leptósyne gigantèa*, Kellogg, which seems a robust form of the Sea Dahlia, but is readily distinguished by its trunk-like woody stem, 2 to 8 feet high, 1 to 5 inches thick, and crowned at the summit with a bunch of finely cut leaves and coreopsis-like flowers.

Telegraph Plant (*Stephanomèria virgàta*, Benth.). Flower heads an inch across or less, entirely of strap-shaped florets (4 to 16) white or flesh colored above, purplish on the back, almost sessile along the leafless upper part of the wand-like stem or slender panicled branches, open only in the early morning. Leaves of lower stem wavy-toothed or deeply divided, upper leaves small, linear. A smooth, upright, rigid-stemmed annual, usually 2 to 6 feet high, but sometimes even 15 feet; very common on the dry plains and foothills of Southern California, eastward to Nevada and Utah, and northward to Oregon; blooming July to October.

A feature of the floral life of California is the presence of many herbaceous plants which take no interest in a world that is not bone-dry, blooming only after the rainy season is long past and most flowers have seeded and vanished. Among these is the Telegraph-plant, which owes its name doubtless to its tall, rigid, pole-like stems, practically leafless. The flowers suggest those of chicory, save that they are not blue. Some botanists prefer to call the plant *Ptiloria virgata*, Greene.

GUM PLANT (*Grindèlia cuneifòlia*, Nutt.). Flower heads about 2 inches across, both disk florets and rays present and both yellow, solitary at the tips of panicled branchlets, the buds remarkable for a covering of whitish gum. Leaves thick, narrow, 3 or 4 inches long, the upper disposed to be clasping at the base and without footstalks. A coarse, bushy plant, woody at the base, $2\frac{1}{2}$ to 4 feet high, blooming showily in late summer and autumn in salt marshes and on seaside shores from Southern California northward.

There are several species of Grindelia indigenous to the Pacific Coast, recognized in a general way by the peculiar gumminess of the buds and flower heads, which occasions the common name Gum Plant. These resinous tops were used medicinally by the Indians—both internally, made into a tea, for troubles of the respiratory organs, and as a wash for rhus poisoning—uses to which modern whites also put them. On the dry hillsides of inland California *Grindelia robusta*, Nutt. is common, which resembles *G. cuneifolia*, but the stem is herbaceous at the base instead of woody, and the larger, more rigid leaves are mostly sharp toothed. Grindelia commemorates a European botanist of a century ago named Grindel.

Rabbit Brush (*Chrysothámnus nauseòsus* (Pursh) Britt.). Flower heads each of 5 yellow disk florets, narrow and about ½ inch high (no rays), and disposed in numerous, flattish-topped, compound clusters. Leaves linear (to almost thread-like in some forms), grayish with loose white wool in the typical form, but this sometimes entirely absent or disappearing in age. A rather rank-smelling, bushy shrub 3 to 10 feet high, the woolly branchlets grayish white, or in some forms becoming smooth and yellowish green in age; abounding in sandy or sterile ground from Southern California along the desert borders and in arid regions northward to British Columbia and eastward to Wyoming and New Mexico; blooming in summer and autumn.

The Rabbit Brush is as typical a plant of the arid regions of the Far West as Sage Brush, in company with which it frequently grows. The species is very variable and its different forms have given botanists no end of trouble to systematize. The name Chrysothamnus means "golden-bush," and very accurately describes the plant when covered with its abounding golden-yellow flowers, which though individually small are showy in the mass. Immense areas are sometimes covered by it.

GUATAMOTE (*Báccharis viminea*, DC.). Flower heads about ⅓ inch high of many whitish or tawny disk florets, no rays present, disposed in small flattish clusters terminating numerous lateral branchlets. Leaves alternate, narrow, willowlike, 2 or 3 inches long. An evergreen, willow-like shrub, the very leafy stems 6 to 12 feet high, often forming dense thickets along water courses and ditches from Southern California to the Sacramento Valley, and from the ocean to the desert borders. Flowering in late winter and early spring.

This common California shrub holds its foliage through the winter and is a favorite browse for live stock, which seem to do well on it, whence the name Mule-fat given to it in some districts. The curious term Guatamote (commonly pronounced *wah-ta-mo'tá*), by which it frequently goes in Southern California, is a Mexican word, and is apt to become distorted by the English-speaking to "water-motor." In this corrupt form it has even got into print.

There are several species of Baccharis on the Pacific Coast, mostly shrubs, but some herbaceous. From the wood of one the San Diego Indians were accustomed to make their fire-drills.

ARROW-WEED (*Plùchea serícea* (Nutt.) Coville). Flower heads of disk florets only, purple, or whitish tinged with red or purple, in terminal clusters. These florets are of two kinds, those of the margin pistillate with slender style branches long exserted and thread-like corollas, the central florets often sterile and with tubular 5-cleft corollas. Leaves alternate, narrow and tapering to both ends, about an inch long, silvery-silky. An erect, grayish, willow-like shrub, 6 to 15 feet high, very leafy, common along streams and in damp ground, forming thickets, Southern California, east through the deserts to the Rio Grande; flowering April to July.

A thicket of Arrow-weed is a welcome feature in the landscape for campers. The perfectly straight, slender stems, abundantly clothed with silky leaves, are readily gathered in quantity sufficient for spreading on the ground as a foundation upon which to lay one's blankets, making a capital substitute for a mattress. Indians found the plant serviceable for thatching their huts, and also made arrow shafts of the stems, whence, doubtless, the common name. The Mexican name for the plant is Cachanilla. In the older botanical reports it was called *Tessaria borealis*.

Mule Ears (*Wyèthia angustifòlia*, Nutt.). Flower heads solitary, 3 to 4 inches across, composed of both ray and disk florets, and both yellow, the involucre an inch high of loose, leaf-like bracts. Leaves alternate, lance-shaped, tapering to both ends, hairy and often somewhat glutinous, the lower ones tufted, 6 inches to a foot or more long, with an erect habit; the stem leaves shorter and usually broader. A perennial herb a few inches to 2 feet high, from a strong root crowned with a short trunk; common from Central California north to Oregon, in moist ground and valley lands, and on hillsides, blooming in late spring and summer.

Wyethia is a genus of several species peculiar to the Far West. Because of the large, bright yellow flowers most of them are lumped in popular parlance as Sunflowers. The ample root leaves with an alert, upright habit are also conspicuous, whence the name Mule Ears. Several species have played an important part in aboriginal economy; the seeds being gathered for food, and the resinous root used in the form of a decoction for an emetic. The edges of the leaves are popularly thought to face north and south.

TAR WEED (*Màdia élegans*, Don.). Flower heads yellow, of both ray and disk florets, the showy rays about ¾ inch long, acutely 3-lobed and often with a dark red spot at the base, opening at evening and closing the next morning; the involucre angled by the keel-shaped bracts, of which each completely enfolds the seed of its corresponding ray; heads axillary and terminal. Leaves narrow, alternate, the basal crowded, 6 inches long or more, the upper much smaller, and sticky with gland-tipped hairs. A stout, gummy annual, 2 to 5 feet high, common on hills from Southern California to Oregon, and east to Nevada; blooming in summer.

The appearance of this flower suggests a Coreopsis, but as it is a night-owl among blossoms, many people never see the flower and know the plant only to be repelled by its unpleasant stickiness of stem and leaf. This is the showiest of several species of Madia, whose seeds entered largely into the food supply of the Pacific Coast Indians. The name is a modification of the Chilean word *Madi*, applied to a species (*M. sativa*, Mol.) growing in Chile as well as in California, whose oily seeds yield an oil once used in cooking.

TARWEED (*Hemizonia lùzulæfolia*, D. C.). Flower heads an inch across or less, of both ray and disk florets, rays 5 to 10, 3-lobed, white (sometimes with a pinkish tinge) or even light yellow, opening only in bright sunshine; heads terminating the panicled branchlets; the seed of each ray floret partially enfolded by the involucral bract. Leaves linear, the upper quite small and sticky, the lower elongated and silky. A sticky, strong-scented, much-branched annual, 8 inches to 2 feet high, common in dry, open grounds, Central and Northern California, blooming from April till November, and often covering extensive areas.

Of the numerous plants on the Pacific Coast known as Tarweed from their disagreeable sticky exudations on stem and leaf, this Hemizonia is one of the commonest. The name means "half-girdle," and is applied to the genus because of the characteristic half encircling of the ray seeds by the involucral bract. *Hemizonia luzulæfolia* is an abundant producer of seeds, which, roasted and ground into meal, contributed an important item of food to the Northern California Indians. The toasted seeds have a pleasant spicy odor.

PINCUSHION (*Chænáctis glabriúscla*, DC.). Flower heads golden yellow throughout, the corollas of the marginal florets with an enlarged throat and fan-like limb (the latter divided into 5 fingers) thus creating the effect of rays about the disk; heads about $\frac{3}{4}$ inch high, solitary at the tips of stout, naked peduncles. Leaves thickish, once to twice divided into a few very narrow lobes. An herbaceous, branching annual, 6 inches to $1\frac{1}{2}$ feet high, common in sandy soil and rocky ground, throughout Central and Southern California, from the coast to the mountains and borders of the desert—blooming from April till June.

The trig, roundish-topped heads of this charming flower, abundant in spring by waysides and on hills, are quite suggestive of the common name Pincushion especially when studded with the protruding stamens and pistils. The species is exceedingly variable, and 4 or 5 varieties are described in the books. Variety *tenuifolia* has almost threadlike divisions to the leaves, and the marginal corollas have the limb so little developed as to be hardly noticeable—the head appearing all disk. Variety *lanosa* is rarely a foot high, leafy only at the base and the herbage whitish with woolliness.

CHÆNACTIS (*Chænáctis artemisæfòlia*, Gray.). Flower heads white, without ray florets, the involucre sticky to the touch, borne on naked peduncles in loose, leafless panicles. Leaves alternate, about 4 inches long, twice or thrice divided into very narrow divisions, more or less sticky-hairy. An upright, branching annual, from 1 to 5 feet high, common in the hills of some parts of Southern California from the vicinity of Los Angeles to San Diego, and southward into Mexico; blooming April to July.

In default of a popular name, the by no means hard botanical generic name (pronounced *Ke-nac'tis*) may serve. Chænactis means "a gaping ray," and was given to the genus because in most species the ray florets are enlarged into a sort of wide-open mouth. This character, however, is not obvious in this species.

There is another white-flowered species, but with marginal florets much enlarged, quite common on the Colorado Desert of California and eastward to Arizona—*Chænactis Fremónti*, Gray. It is a rather slender annual, sometimes only a couple of inches high, and rarely more than a foot tall.

California Sage Brush (*Artemisia californica*, Less.). Flower heads yellowish or whitish, all tubular, very numerous, nodding in panicled racemes. Leaves grayish green, once or twice parted into threadlike divisions, or the uppermost threadlike entire and clustered; pleasantly aromatic. A shrub 2 to 5 feet high, much branched, abundant on hillsides in California from San Francisco southward to Mexico, particularly near the Coast, blooming from May to August.

No fragrance of the hills is more grateful to the average rambler than that of the California Sage when it is released as his clothing brushes against it. Both this and the appearance of the plant suggest the Southernwood of old-fashioned gardens, which is, indeed, an Old World cousin of our plant. I have heard that Spanish-Californians call the California Sage "romerillo," and they make a tea of it for bronchial troubles. It is near akin to wormwood, and a similar bitter principle is resident in it. Owing to the plant's abundance on many hillsides, forming extensive thickets, it is also known in some sections as Hill Brush.

DESERT SAGE BRUSH (*Artemísia tridentàta*, Nutt.). Flower heads small, yellowish, all of disk florets, in dense panicles a foot long; leaves silver gray on both sides, about an inch long, wedge-shaped, the broad, square summit 3-toothed or 3-lobed, aromatic. An erect, much-branched shrub 1 to 6 feet tall (sometimes 10 to 12), with a short trunk and shrubby bark; abundant from Lower California to Washington on plains and mountains bordering the desert and eastward to Montana, Colorado, and Utah; blooming in late spring and summer.

This is the characteristic Sage Brush of the Far West, in places forming the entire vegetal covering of mile after mile. Aside from the use of the short trunks for fuel when timber is unprocurable, white men have small regard for it; but the Indians turned it to account also in a medicinal way. A decoction of the leaves was used in diarrhea, and the mashed leaves were applied to bruises. A variety (*angustifolia*) with narrower leaves, the lower with a roundish summit barely 3-toothed, occurs from Southern California eastward to New Mexico.

Sneezeweed (*Helènium pubérulum*, D.C.). Flower heads solitary on long peduncles, at the ends of clustered branchlets, the spherical disk about ½ inch across of reddish-brown florets, the rays yellow, much shorter than the disk is wide, rather inconspicuous, and usually drooping. Leaves alternate, lance-shaped, the upper an inch or two long (the lowest 4 to 6 inches long), without footstalks and their margins continuous with the stems for a considerable distance. A dark green herbaceous perennial, 2 to 5 feet high, frequent along shady mountain streams and in moist ground throughout California, blooming from June to October.

The flower heads of Sneezeweed are very peppery and bitter. The powdered flowers and leaves of an eastern species (*H. autumnale*, L.) have been used to produce sneezing, whence the common name; and doubtless our species would have the same effect. Mr. Chesnut records a Yokia Indian name for the plant that means Beaver Flower—probably originating in a fancied resemblance of the winged stems to a beaver's tail. A Spanish-California name for it is Rosilla—"little rose."

Douglas's Groundsel (*Senècio Douglásii*, DC.). Flower heads yellow, with both ray florets and disk, the rays about a dozen, light yellow, narrowish, and barely ½ inch long, in terminal, loose-branching clusters. Leaves alternate, white-woolly, divided into narrow almost thread-like lobes. A somewhat shrubby perennial, forming a bush usually 3 or 4 feet high, but sometimes taller, common on open plains, in gravelly washes, and on foothill slopes in Southern and Central California, eastward through Arizona and Utah to Texas and Nebraska; blooming from July to December.

The genus Senecio is an exceedingly numerous one, comprising perhaps 1,000 species altogether, distributed almost throughout the world. Of these there are more than 40 species indigenous to the Pacific Slope. They are of varied aspect, some being entirely devoid of rays. In most species the copious pappus of soft white bristles is a noticeable feature. This character is probably responsible for the name Senecio, which is a modification of the Latin *senex*, an old man. Douglas's Senecio is one of the most conspicuous wild plants of the late year in Southern California, a period when the floral tide is at its lowest.

Brass Buttons (*Còtula corónopifólia*, L.). Flower heads yellow without rays, about ½ inch in diameter, solitary on slender peduncles. Leaves linear, lance-shaped, or coarsely toothed on the same plant, and clasping at the base around the stem. An herbaceous, rather succulent perennial, a foot or so high, quite common in marshes and along streams and ditches in California; blooming pretty much the entire year.

The cheerful rotund flowers of this Cotula are well described by the common name of Brass Buttons. They give a lively sparkle of color to many a wet wayside particularly near the coast. I believe the Spanish-Californians call the plant a little more courteously, Boton de Oro, that is "gold button." It is an immigrant to our shores, its native home being South Africa. The foliage is strongly but not unpleasantly scented.

There is a dainty little Australian cousin of Brass Buttons which has become noticeable in spring along city streets and in lawns in California. Its flower heads are barely ⅛ inch in diameter, yellowish white, rising on threadlike peduncles out of the parsley-like foliage of the plant, which spreads close to the ground. It is *Cótula austràlis*, Hook. f.

MANZANILLA (*Matricària discòidea*. D.C.). Flower heads greenish yellow, with a fringe of white at base, somewhat egg-shaped, about ¼ inch high, borne in loose, terminal clusters. Leaves much dissected into short, very narrow lobes, pleasantly scented. A leafy annual, a few inches to a foot high, blooming from February to July, common along waysides and in open grounds from Southern California to Alaska, and eastward more sparingly along the railroads even to the Atlantic Coast.

This familiar little plant shows its chubby round face in the spring, and is worthy of more respect than it usually gets. Pinch its leaves and you are rewarded with a delicious, if faint, fragrance of apples. Perhaps from this has originated the name by which the Spanish-Californians call it—Manzanilla, which means, a "little apple." They have long recognized it as a medicinal herb, and have employed it, I believe, for bowel complaints and ague. It is a confirmed globe-trotter, having spread from its native home in northern Asia not only eastward to our Pacific Coast (its first foothold in America) but westward to Europe, where it has long been naturalized.

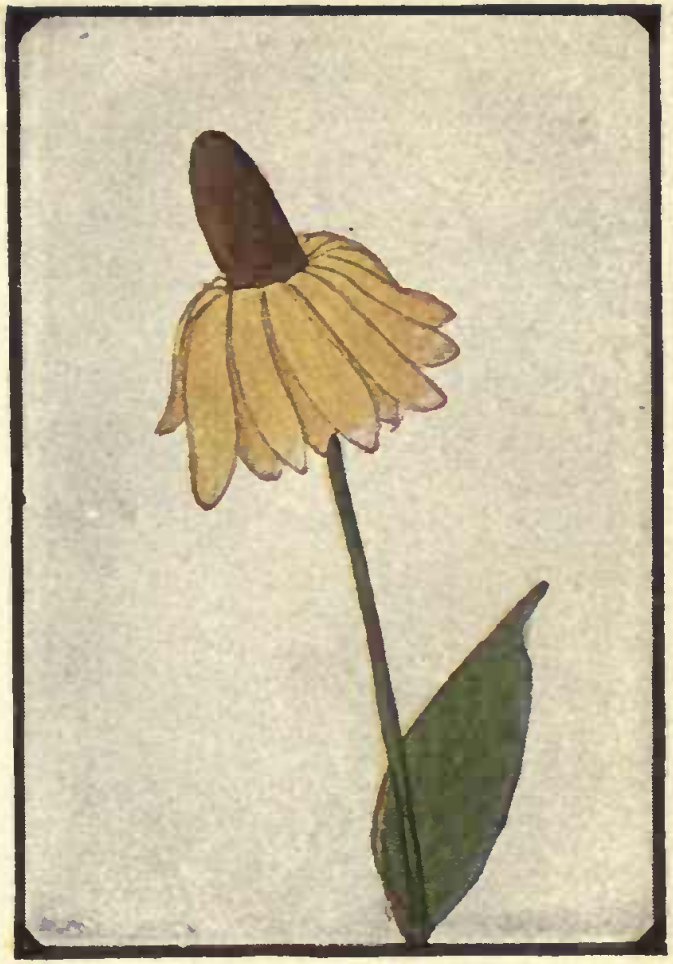
ERIOPHYLLUM. GOLDEN YARROW (*Eriophýllum confértiflòrum* (DC.), Gray). Flower heads golden yellow, about $\frac{3}{8}$ inch across, with both disk and ray florets (the rays rather roundish), in crowded, flat-topped clusters with short peduncles. Leaves alternate, wedge-shaped in outline and parted into several narrow divisions. A plant 1 to 2 feet high, white at first with a close woolliness that later disappears; frequent on hills and in the mountain chaparral belt at low altitudes; Southern and Central California, blooming from March till August.

This is one of the noticeable plants of the Yosemite woodlands, and is readily recognized by its blossoms suggesting in form and arrangement those of the yarrow, but yellow instead of white. The botanical name of the genus means "woolly foliage," suggested by the white tomentum that clothes most of the species in youth. *Confertiflorum*, the specific appellative, means "with crowded flowers."

A kindred species is *E. cæspitosum*, Dougl., widely distributed in several varieties from British Columbia to Southern California. It is noticeable in the redwood and the Sierra forests, with numerous stems sprawling about the ground from one root, and showy flower heads usually solitary on prominent peduncles.

Cone Flower (*Rudbéckia californica*, Gray). Flower heads composed of both disk and ray florets, the disk brown-purple becoming conical in age, the rays pure yellow, drooping, 1 to 2 inches long or even more; the heads solitary on a long flower stalk. Leaves alternate, more or less toothed, ovate to lance-shaped, the upper without footstalks. A somewhat hairy plant with a simple stem 2 to 4 feet high, of frequent occurrence in meadows and in moist ground in the Sierra Nevada, including the Yosemite region; blooming in summer.

A conspicuous feature of the Cone Flower is the conical or cylindrical disk which increases in height with age until it often stands an inch high in the midst of the rays, and sometimes as much as $2\frac{1}{2}$ inches high. In the mountains of Northern California and Oregon and eastward to Wyoming is a curious species—*Rudbeckia occidentális*, Nutt.—in which the rays are wholly wanting, and the brownish disk stands in lonely grandeur 1 to $1\frac{1}{2}$ inches high. The name Rudbeckia was given to this beautiful genus in honor of two Swedish scientists, father and son, named Rudbeck, who preceded Linnæus at the University of Upsala. Several species have long been cultivated in European gardens.



BAILEYA (*Baileya pauciradiata*, H. & G.). Flower heads yellow composed of both disk and ray florets, the latter 5 or 6 in number, short and of a pale lemon tone becoming papery at maturity and reflexed; borne singly on short peduncles. Leaves densely white woolly, alternate, narrow, without footstalks. A much-branched, leafy, herbaceous plant from a few inches to 1½ feet high, abundant in the desert regions of Southeastern California, eastward to Arizona, blooming March to May.

Baileya is one of the flowers sure to attract the eye of the tourist on the California desert in spring, both because of the rather ghostly aspect of the plant in its white woollens and the pale look of the flowers with their wan, turned-down rays—altogether a somewhat unhappy appearing specimen, yet very lovely. A kindred species, found on the Mojave Desert and thence eastward to New Mexico, is *Baileya multiradiata* (var. *pleniradiata* (H. & G.), Coville), with very numerous rays, and flower heads on long peduncles.

The name Baileya preserves the memory of Prof. Jacob Whitman Bailey, "the father of microscopic research in America."

VENEGASIA (*Venegàsia carpesiòides*, DC.). Flower heads showy, 2 inches across or more, yellow, composed of both disk and ray florets, the latter 15 to 20 in number, usually entire and acute but not infrequently toothed or gashed at the tip; heads few, terminal, and in the upper axils on short footstalks. Leaves alternate, thin, slender-petioled, ovate with a somewhat heart-shaped base, resinous-dotted underneath. A leafy perennial, frequent on rocky banks of streams and under the shade of trees in the cañons of the Southern California mountains below 3,000 feet; blooming in summer.

The general aspect of Venegasia suggests a sunflower. The smoothness of stem and herbage is, however, in marked contrast to the harshness of the sunflower plant; while an examination of the flower head reveals several differences. In Venegasia, for instance, the receptacle is naked, and the ray florets fertile, while in the sunflower the receptacle is chaffy and the rays sterile. The name Venegasia was given in commemoration of Padre Miguel Venégas, a gallant old Jesuit missionary to the Indians and early writer on Lower California.

STAR THISTLE (*Centaurèa melitènsis*, L.). Flower heads small, the florets yellow and all tubular, rising out of a globular involucre which is armed with prickly spines. Leaves alternate, gray green, the upper narrow, without footstalks and decurrent upon the stem, in the form of long, narrow wings; the basal leaves lyre-shaped and deep-lobed. An erect, much-branched annual 1 to $2\frac{1}{2}$ feet high, common in fields and by roadsides, California and Arizona, blooming May to November.

The Star Thistle attracts attention both because of its pretty, thistle-like golden flowers, and because of its vicious prickliness. On the latter account it is in general disgrace; yet it is of good family and its cousins, the Cornflowers, the Sweet Sultans, and the Dusty Millers, are cherished garden plants. The Star Thistle is an immigrant on the Pacific Coast, its original home being southern Europe. The specific name, *Melitensis*, indeed, means "Maltese." The popular name, Star Thistle, also is of interesting etymology—the spiny, globular involucre suggesting the medieval weapon called "morning star"—a metal ball set with spikes, and mounted on a long handle.

Milk Thistle (*Sílybum Mariánum*, Gærtn.). Flower heads 1 to 2 inches across, with tubular rose-purple florets; solitary at the branch ends. Leaves prickly, deeply lobed and wavy margined, the shiny green surface conspicuously blotched with white along the veins. Stout annuals or biennials, 3 to 6 feet high, along roadsides and in fields, Central and Southern California, flowering in summer.

An immigrant from the Mediterranean region, the beautiful Milk Thistle has abused its freedom in our Land of Liberty, and in some places has become a persistent interloper and a nuisance in cultivated grounds. There is an Old World tradition that the white markings upon the leaves are due to drops of milk that fell from the Virgin's breast as she nursed the infant Christ. For this reason the plant has also been called Our Lady's Thistle and Blessed Thistle. In old European gardens it used to be grown both for ornament and for its edibleness. The roots were boiled for pot herbs, the heads treated as the artichoke, and the young leaves made into spring salads.

WESTERN THISTLE (*Cárduus occidentális*, Nutt.). Heads solitary on long peduncles, the tubular florets a clear red or crimson, 1 to 1½ inches long, the involucre densely covered with cobwebby hairs. Leaves rather deeply lobed, only mildly prickly, smoothish above, white-hairy beneath. A stout plant 2 to 5 feet high, the stems when young very white with a coating of cottony wool. In its different forms—it is quite variable—it is common from the Lower California line to Southern Oregon, and from the coast to the desert; blooming in spring and summer.

This lovely thistle catches the eye instantly when seen amid the dun chaparral of the foothills, where its bright red showy heads glow like coals. One variety—*candidissimus*—common in northeastern California, is remarkable for having the entire foliage almost snow white with a persistent woolliness.

A peculiar thistle frequently found in mountain meadows of the Pacific Slope from Lower California northward is *Carduus Drummondii*, var. *acaulescens* (Gray) Coville, characterized by having several heads of white flowers (but sometimes magenta) sessile in the centre of a rosette of leaves flat upon the ground.

ARTICHOKE (*Cynara Scólymus*, L.). Flower heads very large, 2 to 3 inches in diameter, of disk florets only which are bright blue, borne at the tip of loosely clustered branchlets; involucral bracts broad, leathery, and tipped usually with a long spine. Leaves ample, 2 to 3 feet long, deeply lobed (the lobes sharply toothed), and silvery green with a hoary woolliness. Robust herbs, 2 to 4 feet high, from perennial roots, occasional by roadsides in California, blooming in June or July.

This regal plant, whose flowers suggest a glorified blue thistle, is a native of the Mediterranean region, and is extensively cultivated as a vegetable in some parts of California—the involucral bracts being eaten. Its seeds, like the thistle's, supplied with generous plumes, are borne by the winds considerable distances. In this way the plant has escaped from gardens, and set up for tself in the open.

There is a native American plant also known as Artichoke, but of quite a different aspect from this Cynara. It is *Helianthus tuberosus*, L., a sunflower of the Middle West. Its tubers are the edible part.

WESTERN DANDELION (*Tróximon grandiflòrum*, Gray). Flower heads yellow, 1 to 1½ inches high, all florets strap-shaped, borne singly at the top of stout, naked, hollow stems, a foot or two high. Leaves all basal, lance-shaped, deeply cut. A perennial herb with a strong, deep taproot. Common on plains and moist hillsides from Southern California to Washington, blooming in spring and summer.

Troximon is so much like the common dandelion of the East that the difference, while apparent in a general way, is yet hard to define. Botanists find an essential distinction in the character of the seeds (achenes)—those of the dandelion being roughened above with tiny, hard processes, while those of Troximon are not so. These achenes in *Troximon grandiflorum* have a noticeably long, capillary beak—3 or 4 times the length of the seed body. Troximon is indigenous only to the New World, principally to the United States west of the Mississippi. One or two species have been introduced in a small way into European gardens. There are a dozen or more species and varieties found on the Pacific Slope, 2 or 3 with purple flowers, and as many with orange flowers.

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WHITE, or WHITISH

1. *Flowers clustered or racemose*

MUILLA. Small (tinged with green) wheel-shaped flowers in umbels.
DESERT LILY. Suggesting an Easter Lily; in racemes; basal leaves long and crinkly.
WASHINGTON LILY. Horizontal, fragrant; in pyramidal racemes.
OUR LORD'S CANDLE. A huge panicle rising out of a round mass of dagger-like leaves.
SOAP PLANT. Small with recurved segments; in loose, wide-spreading panicles; opening in the afternoon.
ZYGADENE. Star-like with a greenish spot at base of each segment; in racemes or panicles.
SQUAW GRASS. Dense racemes; leaves grass-like in a large basal tuft.
KNOTWEED. In dense spikes, a plant of wet mountain meadows.
MINER'S LETTUCE. Small flowers in racemes, rising out of two united leaves that make a cup around the stem.
GHOST FLOWER. Whole plant pure white, the leaves reduced to scales.
INSIDE-OUT FLOWER. Small, drooping, numerous in a loose panicle.
PEPPER-ROOT. In loose racemes, 4 petals.
WHIPPLEA. Small, calyx and corolla colored alike, in clusters at branch-ends.
ALUM-ROOT. In a loose, feathery panicle; leaves basal.
RATTLEWEED. Pea-like, narrow; leaves pinnate; seedpods inflated like bladders.
EULOPHUS. In long-stalked compound umbels. In damp mountain meadows.
SALAL. Urn-shaped, in racemes. A low, evergreen shrub.

PINE DROPS, In a many-flowered raceme. Plant leafless, brownish red.

SHOOTING STAR. Corolla lobes sharply turned back as in cyclamen.

SEA PINK. In clustered heads with chaffy bracts. Seaside.

WOOLLY MILKWEED. Corolla with reflexed divisions, in umbels; milky juice.

POPCORN FLOWER. Small but numerous in fist like coiled clusters.

PITCHER SAGE. Large, with purplish tinge, pitcher-shaped. Aromatic.

WHITE SAGE. Corolla 2-lipped, the lower ruffled; in panicles. Shrubby, with whitish, aromatic leaves.

HOREHOUND. Small, crowded in dense clusters. Leaves gray-green, wrinkled.

BLACK NIGHTSHADE. Small, wheel-shaped, anthers forming a yellow cone at centre.

COULTER'S SNAPDRAGON. 2-lipped, the lower much puffed out; in spikes.

ELDER. Small in flat-topped clusters. A shrub or tree.

2. *Flowers solitary, or nearly or apparently so*

FAIRY BELLS. Small, bell-shaped flowers on slender stalks almost hidden beneath the leaves.

CALIFORNIA WAKE ROBIN. Flower sessile upon a whorl of leaves.

LANTERN OF THE FAIRIES. Globe-like, nodding; at tips of the branches.

MARIPOSA TULIP. Tulip-like, with a dark red blotch at the base of each petal.

YERBA MANSA. Flowers in a conical spike in the midst of white bracts; leaves like a dock.

ICE PLANT. Very numerous linear petals; seaside plant with a glistening encrustation.

BITTER-ROOT. Large flowers opening in the sunshine; on a low plant with thick linear leaves.

PRICKLY POPPY. Large, with crumpled petals,

a golden centre of many yellow stamens; a prickly herb.

CREAM-CUPS. Solitary on leafless flower stalks.

MOUNTAIN MISERY. In few-flowered terminal clusters, resembling strawberry blossoms; plant resinous.

WOOD SORREL. Solitary, leaves clover-like.

STRAWBERRY CACTUS. Small; a little round cactus bearing a scarlet berry.

DESERT EVENING PRIMROSE. Single on long axillary peduncles, turning gradually pink.

WHITE HEATHER. Solitary from axils of seed-like leaves. Sub-alpine.

PRINCE'S PINE. Petals roundish, concave, and turned back.

EVENING SNOW. Salver-form, fragrant, brownish outside. Opening toward evening.

SPOTTED NEMOPHILA. Saucer-shaped, a purple blotch at tip of each corolla lobe.

YERBA BUENA. Small, solitary on axillary footstalks. A fragrant, creeping vine.

TOLUACHE. Trumpet-shaped, wilting after noon.

3. *Flowers composite; herbs*

WHITE DAISY. Yellow disk; stalk sticky above.

TELEGRAPH PLANT. Florets strap-shaped, sessile on wand-like branches—open only in morning.

CHÆNACTIS. Without rays, in leafless panicles.

TAR WEED. Rays 3-lobed, opening in the sunshine. A sticky annual.

4. *Shrubs, Climbing Vines or Trees*

JOSHUA TREE. Small, grotesque tree, flowers clustered at ends of limbs with dagger-like leaves.

WILD BUCKWHEAT. Small shrub; flowers in dense terminal heads.

WILD CLEMATIS. A woody vine, with panicles of creamy white flowers.

MATILIJA POPPY. Similar to Prickly Poppy in flower, but the plant a smooth shrub.

SYRINGA. Large, fragrant, in terminal panicles; a shrub.

ISLAY. In rather dense axillary racemes. An evergreen shrub or small tree.

THIMBLE-BERRY. In few flowered clusters terminal on long stems. A shrubby bush.

CHAMISE. Small, in showy, crowded panicles; a shrub of the foothills, with needle-like leaves.

CALIFORNIA HOLLY. Small, in dense panicles; an evergreen shrub or small tree.

MOUNTAIN MAHOGANY. Inconspicuous flowers without corolla, resembling a tiny cup full of stamens.

LEMONADE BERRY. Small in dense clusters. A stout evergreen shrub.

SUMAC. Small in showy, terminal panicles. An evergreen shrub.

CALIFORNIA BUCKEYE. Irregular corollas in dense showy panicles. A shrub or low tree.

DEER-BRUSH. Petals small with a long claw ending in a little hood; in showy feathery clusters; a mountain shrub.

NUTTALL'S DOGWOOD. Conspicuous white bracts encircling a button-like cluster of little greenish flowers. A small tree.

CALIFORNIA HUCKLEBERRY. Small, waxen, bellshaped. A shrub.

MADROÑO. Waxen, urn-shaped in large showy clusters. A tree.

MANZANITA. Urn-shaped in short racemes; a smooth, red-barked shrub.

WESTERN AZALEA. Showy, fragrant, a yellow blotch on one petal. A mountain shrub.

CALIFORNIA STORAX. Bell-shaped in drooping racemes; shrub.

BIG ROOT. Rather small, wheel-shaped, in axillary racemes. An herbaceous vine.

GUATAMOTE. Composite, small, without rays; a willow-like shrub along water courses.

YELLOW OR ORANGE

1. *Flowers clustered or racemose*

LEOPARD LILY. Nodding in pyramidal racemes; tips rolled back.

GOLDEN STARS. Numerous star-like flowers in umbels on long stalks; filaments not winged.

GOLDEN BRODIÆA. Flowers funnel-formed, filaments winged.

MESCAL. Panicled on a stalk 8 to 10 feet high, from clustered basal, dagger-like leaves. Desert.

DESERT TRUMPET. A desert plant with tiny flowers and inflated stalks, swelling gradually upward.

SULPHUR FLOWER. Umbeled heads on stalks from a rosette of grayish green leaves; a mountain plant.

CALIFORNIA BUTTERCUP. Petals (10 to 15) shining yellow.

GOLDEN EAR-DROPS. Flattened, heart-shaped flowers.

WILD MUSTARD. Tall, branching, herbaceous plants, sometimes 12 feet high, often forming thickets.

ORANGE WALL-FLOWER. In showy racemes, somewhat fragrant.

LUPINE (STIVERS'). Pea-like, with yellow banner, rose pink lateral petals.

BUTTER-AND-EGGS. 2-lipped, the lower inflated with 3 sacs; upper lip purple.

YELLOW MONKEY FLOWER. In racemes; corolla 2-lipped, the bright yellow lower lip often blotched with brown.

MUSK. 2-lipped, in pairs in axils of upper leaves; musk scented, plant of damp places.

MULLEIN. Flat wheel-shaped, stamens bearded with violet wool.

FENNEL. In compound, flat umbels. Leaves very finely dissected, with a fragrance of licorice.

WILD BOUVARDIA. Funnel form, in salmon-colored hemispherical heads.

WHISPERING BELLS. Bell-shaped, drooping on thread-like stalks.

FIDDLENECK. In coiled spikes. Hairy.

2. *Flowers solitary, or nearly or apparently so*

GOLDEN TULIP. Cup-shaped, rather small, purplish within, grass-like leaves.

CHAMISE LILY. Lily-like flowers in a loose raceme, on a stalk from 2 mottled, basal leaves.

CALIFORNIA POPPY. Solitary, 2 to 4 inches in diameter, cup-shaped.

BUR-CLOVER. Small, pea-like, 2 or 3 together on an axillary footstalk.

MEADOW FOAM. Solitary, conspicuously veined; leaves much dissected.

MOCK ORANGE. Bell-shaped with recurving lobes; solitary. A prostrate vine.

MOHAVEA. Somewhat bell-shaped, purple dotted; a delicate desert annual.

WILD PANSY. Upper petals tinged with brown outside.

CREEPING VIOLET. Small; plant prostrate and creeping.

BLAZING STAR. Petals terminating in pointed tips; stamens very numerous.

CHOLLA. A cactus with cylindrical, jointed stems.

NOPAL. A cactus with flat, jointed stems.

BISNAGA. Flowers in a circle at top of a large cylindric plant of the desert.

SUNCUPS. Axillary on leafy stems; stigma a tiny round ball; seed vessels twisted.

BEACH PRIMROSE. Turning greenish when withering. A gray plant of the sea-beaches.

3. *Flowers composite; herbs*

TIDY-TIPS. Rays usually tipped with white; solitary.

MALACOTHRIX. Florets strap-shaped; leaves basal.

YELLOW DAISY. Disk florets yellow; coreopsis-like.

SEA DAHLIA. Disk yellow; solitary and large; fleshy leaved seaside plants.

CALIFORNIA SAGE BRUSH. No rays, inconspicuous, clustered, nodding in panicled racemes. An aromatic shrub with finely dissected leaves.

GUM PLANT. Disk yellow; buds sticky with a whitish gum.

MULE EARS. Large, disk yellow; leaves of upright habit.

TAR WEED. Disk yellow, a dark red spot at base of each ray; opening at evening. Plants sticky.

PINCUSHION. Disk yellow, marginal florets with a fan-like limb.

SNEEZEWEED. With spherical disk, and inconspicuous drooping rays.

DOUGLAS'S GROUNDSEL. Rays narrowish, disk yellow, leaves white woolly.

BRASS BUTTONS. Without rays, solitary. Wet places.

MANZANILLA. Without rays, disk egg-shaped. A small plant with fragrance of apples.

ERIOPHYLLUM. Ray florets with rather roundish limbs; in crowded flat-topped clusters.

CONE FLOWER. With a conspicuous brownish-purple disk becoming conical in age.

SUNSHINE. Base and margins of involucre white with hairs. A desert herb.

WILD SUNFLOWER. Dark disk; a tall, rough, branching annual.

BAILEYA. Rays short, pale, and reflexed at maturity. A desert annual.

VENEGASIA. Showy, resembling a sunflower.

STAR THISTLE. Small thistle-like heads of tubular yellow disk florets; no rays.

WESTERN DANDELION. Florets strap-shaped. Leaves basal.

RABBIT BRUSH. Small, without rays, flat-clustered; bushy shrub.

DESERT SAGE BRUSH. No rays, inconspicuous leaves wedge-shaped, 3-toothed. Desert and desert borders.

4. *Shrubs, Climbing Vines or Trees*

OREGON GRAPE. In terminal, clustered racemes; leaves odd-pinnate; a shrub.

TREE POPPY. A shrub with willow-like leaves; flowers solitary on the branchlets.

BLADDER POD. In terminal racemes; soon developing long-stalked, bladdery seed pods; a shrub.

YELLOW WILD CURRANT. Both calyx and petals yellow; in green bracted racemes scattered along the branches; a shrub.

YELLOW LUPINE. Pea-like, in long racemes; a shrub of the seaside sands.

DEER-WEED. Pea-like, small, turning reddish, in umbels. A woody perennial of the hills.

MESQUIT. In dense, cylindric, narrow spikes. A desert tree.

CREOSOTE BUSH. Solitary, the 5 petals twisted edgewise to the light. A desert shrub.

RABBIT BRUSH. Composite; small, without rays, flat-clustered; a bushy shrub of the desert and desert borders.

CALIFORNIA SAGE BRUSH. Composite, no rays, inconspicuous, clustered, nodding in panicled racemes. An aromatic shrub with finely dissected leaves.

DESERT SAGE BRUSH. Composite, no rays, inconspicuous; leaves wedge-shaped, 3-toothed. Desert and desert borders.

STICKY MONKEY FLOWER. Funnel-form, with ragged-edged lobes, on axillary footstalks; salmon color.

YELLOW BEARD-TONGUE. Corolla 2-lipped, arched above, and gaping.

SQUAW BUSH. Small, in spike-like clusters before the leaves. A shrub.

FREMONTIA. Without petals, the calyx corolla-like. A small tree with leathery leaves.

TREE TOBACCO. Tubular in loose panicles. Shrub or small tree.

INCIENSO. Composite, rays and disk alike yellow; leaves silvery white; a desert shrub.

ENCELIA. Composite, rays yellow, brownish purple disk.

RED

(Including Reddish Purple)

1. *Flowers clustered or racemose*

FIRECRACKER FLOWER. Tubular, in a loose umbel, like a little bunch of firecrackers on a stalk.

CLINTONIA. Many-flowered globose umbels; leaves radical.

TURKISH RUGGING. A much branched, brittle, practically leafless little plant of the dry hillsides.

CALIFORNIA FOUR O'CLOCK. Open bell shaped, expanding about mid-afternoon.

RED MAIDS. Loose, leafy racemes; common in grassy places.

RED COLUMBINE. Petals produced downward into long hollow spurs.

SCARLET LARKSPUR. Upper sepal prolonged backward into a spur.

HEN-AND-CHICKENS. Corolla cylindrical, petals upright.

GOLONDRINA. Inconspicuous in a cup-shaped involucre, margined with white or rosy appendages resembling petals. A prostrate little plant with milky juice.

DESERT MALLOW. Brick-red, in wand-like panicles.

WILD FUCHSIA. Funnel-form, both calyx and corolla colored.

FAREWELL-TO-SPRING. Funnel-form, calyx tube produced above the ovary, the lobe

more or less cohering and turned to one side.

HEATHER. Saucer-shaped in clusters. High-mountain plant.

SNOW PLANT. A fleshy, leafless, columnar plant, red throughout.

SIERRA PRIMROSE. In umbels. High-mountain plant.

CALIFORNIA BEE PLANT. Corolla globular, upper lip erect.

CHINESE HOUSES. 2-lipped, the upper white; in a series of interrupted whorls.

INDIAN PAINT BRUSH. In spikes; corolla hidden in brightly colored calyx.

INDIAN WARRIOR. 2-lipped, compressed at sides and arched above; in spikes.

OWL'S CLOVER. 2-lipped, the lower sac-like and white; in dense spikes.

SCARLET MONKEY FLOWER. 2-lipped; the upper erect, the lower turned back.

CRIMSON MONKEY FLOWER. Funnel-form with a yellow centre; sticky, hairy.

SCARLET BUGLER. Tubular, in narrow panicles.

WESTERN CARDINAL FLOWER. 2-lipped, corolla tube split down the upper side.

CAÑON LUPINE. Pea-like, in long, terminal racemes, tending to pink.

2. *Flowers solitary or nearly or apparently so*

CALIFORNIA WAKE ROBIN. Flower sessile upon a whorl of 3 leaves.

DESERT MARIPOSA TULIP. Tulip-like flowers of the desert region.

FIG MARIGOLD. Very numerous linear petals; seaside plant with fleshy, 3-sided leaves.

BITTER-ROOT. Large flowers, opening in the sunshine on a low plant with thick, linear leaves.

INDIAN PINK. Petals deeply slashed into 4 narrow divisions.

WILD PEONY. Flowers globular in form; a dark crimson.

FLAMING POPPY. Petals fugacious.

HEDGEHOG CACTUS. Showy with green stigmas; the plant a cluster of short, cylindrical heads.

PIMPERNEL. Wheel-shaped, on thread-like axillary footstalks.

3. *Flowers composite; herbs*

MILK THISTLE. With thistle-like heads of tubular florets. Leaves blotched with white.

WESTERN THISTLE. Thistle-like heads, solitary on long peduncles.

4. *Shrubs, Climbing Vines or Trees*

SWEET SHRUB. Petals, sepals, and stamens passing into one another.

WILD GOOSEBERRY. Drooping in few-flowered racemes, scattered along prickly branches; a shrub.

PRIDE OF CALIFORNIA. Pea-like, the banner (an inch long) leaning back upon the flower stalk. A vine.

OCOTILLO. Tubular in terminal spikes, on thorny, whip-like, leafy stalks; a desert shrub.

SCARLET HONEYSUCKLE. 2-lipped, and narrow, stamens and pistils included in protruding lower lip. Vine-like.

CHUPAROSA. Tubular, 2-lipped; an almost leafless desert shrub.

ARROW-WEED. Composite, small, without rays, clustered; a grayish shrub of wet places.

PINK

1. *Flowers clustered or racemose*

TWINING WILD HYACINTH. In a many-flowered umbel at the top of a leafless, twisting, vine-like stem.

CLINTONIA. Many-flowered globose umbel; leaves radical.

SAND VERBENA. A low trailing plant of sea-coast and desert; many-flowered, long-stalked heads.

PUSSY PAWS. Cushion-like clusters; leaves in a basal rosette.

BLEEDING HEART. Flattened, heart-shaped flowers.

INDIAN RHUBARB. In panicles, blooming before the leaves, which appear in summer 1 to 2 feet across.

LUPINE (STIVERS'). Pea-like, with yellow banner and rose-pink lateral petals.

CAÑON LUPINE. Pea-like, in showy terminal racemes a foot long.

WILD CLOVER. In broad, flattish heads an inch across.

FILAREE. Small in few-flowered umbels.

WILD HOLLYHOCK. In terminal racemes; stem leaves much divided.

CLARKIA (Elegans). Petals rhomboidal, abruptly narrowed to slender claws.

CLARKIA (Concinna). Petals with 3 terminal lobes.

JEFFREY'S SHOOTING STAR. Petals strongly turned back, like cyclamen.

SEA PINK. In clustered heads with chaffy bracts. Seaside.

CANCHALAGUA. Star-like, with yellow eye, in a loose panicle.

FRINGED GILIA. Funnel-form, with a yellow throat, corolla segments fringed.

PRICKLY PHLOX. Salver-form, with a white centre; leaves crowded, needle-like.

2. *Flowers solitary, or nearly or apparently so*

ICE PLANT. Very numerous linear petals; seaside plant with a glistening encrustation.

WOOD SORREL. Solitary, leaves clover-like.

3. *Shrubs, Climbing Vines or Trees*

WILD BUCKWHEAT. Small shrub; flowers in dense terminal heads.

PINK WILD CURRANT. Calyx colored like a corolla, in long, drooping racemes; a shrub.

THIMBLE-BERRY. In few-flowered clusters terminal on long stems. A shrubby bush.

CALIFORNIA WILD ROSE. Flowers 1 to 2 inches across.

LEMONADE BERRY. Small in dense clusters. A stout, evergreen shrub.

MALVA ROSA. About 2 inches across, single, on axillary drooping footstalks; leaves maple-like.

CALIFORNIA HUCKLEBERRY. Small, waxen, bell-shaped. A shrub.

WESTERN AZALEA. Showy, a yellow blotch on one petal. A mountain shrub.

ROSE BAY. In terminal umbels without fragrance. An evergreen shrub.

SALAL. Urn-shaped, in racemes. A low, evergreen shrub.

BLUE

(Including Bluish Purple)

1. *Flowers clustered or racemose*

BRODIÆA. Flowers in compact heads on tall stalks; leaves grass-like.

HARVEST BRODIÆA. Like small blue lilies bunched at the top of a leafless stalk.

CAMASS. Loose racemes of 6-parted flowers on scapes a foot or two high.

BLUE-EYED-GRASS. Star-like with a yellow centre. Leaves grass-like.

BLUE LARKSPUR. Upper sepal produced backward into a spur.

MONKSHOOD. One enlarged sepal shaped like a hood.

WILD RADISH. 4 petals, forming a cross.

BEACH BLUE LUPINE. Pea-like, the banner with a yellow spot; in racemes. Shrubby.

WILD CLOVER. In broad, flattish heads an inch across.

WILD HOLLYHOCK. In terminal racemes; stem leaves much divided.

BIRD'S EYE. Funnel-form, 5 purple spots at the throat; in few-flowered clusters.

BLUE GILIA. Corollas rather small in crowded heads.

WILD HELIOTROPE. In clustered coils, unrolling as flowers expand.

WILD CANTERBURY BELL. Large, bell-shaped, in loose racemes.

TURPENTINE WEED. A one-sided raceme; stamens exserted and curving; odorous of turpentine.

PENNYROYAL. In crowded heads with purplish bracts. Aromatic.

CHIA. Small, in interrupted whorls, with purplish, prickly bracts.

VIOLET NIGHTSHADE. Saucer-shaped, showy, with green-encircled white spots at centre; in umbeled clusters.

CHINESE HOUSES. 2-lipped, the upper white; in a series of interrupted whorls.

BLUE BEARD-TONGUE. Funnel-form, inflated at throat, in showy panicles. Upper leaves joined at base.

VIOLET BEARD-TONGUE. Funnel-form, 2-lipped; in narrow panicles.

CALIFORNIA HAREBELL. Bell-shaped with 5 slender, recurving lobes.

2. *Flowers solitary, or nearly or apparently so*

FETID ADDER'S TONGUE. Petals upright, thread-like; sepals whitish, purple-striped.

CALIFORNIA WAKE ROBIN. Flower sessile upon a whorl of 3 leaves.

BLUE FLAG. Stemless plants forming mats over the ground.

BABY-BLUE-EYES. With a white centre; solitary.

3. *Flowers composite; herb*

ARTICHOKE. Composite; huge thistle-like heads; ample leaves silvery green.

4. *Shrubs or Trees*

DALEA. Pea-like, in loose clusters. A desert shrub.

CALIFORNIA LILAC. Petals small with a long claw ending in a little hood; in showy panicles; a shrub or small tree.

ROMERO. Flowers clothed in violet wool; stamens exserted and curving. Small shrub.

BLADDER BUSH. 2-lipped, the lower blue, the upper white. Calyx bladder-like in age.

LAVENDER or LILAC

FIVE-SPOT. Globe-like, the petals with a reddish spot at base. A desert plant.

SHOOTING STAR. Corolla lobes sharply turned back, as in cyclamen.

PRICKLY PHLOX. Salver-form, with a white centre; leaves crowded, needle-like.

LARGE-FLOWERED PHACELIA. Saucer-shaped, showy, in loose racemes.

YERBA SANTA. Funnel-form, in coils of a terminal panicle; shrub with resinous leaves.

BLACK SAGE. Flowers small, 2-lipped, in dense interrupted whorls. Shrubby, aromatic.

THISTLE SAGE. Flowers 2-lipped, lower lip fan-shaped; woolly, globular heads.

GIANT HYSSOP. Small, in crowded spikes; plant nettle-like in appearance.

SEASIDE DAISY. Composite, numerous, very narrow rays. Seaside.

MARIPOSA TULIP. Tulip-like, a dark red blotch at base of each petal.

GREENISH

MUILLA. Small, wheel-shaped flowers in umbels.

False Hellebore. In large panicles; plants 3 to 7 feet tall, with plaited sheathing leaves.

Stream Orchis. A leafy orchid, 1 to 4 feet high with clasping, parallel-nerved leaves in wet places.

Castor Oil Plant. In terminal racemes. A tall, herbaceous plant with large palmate leaves.

Squaw Bush. Small (yellowish) in spike-like clusters, before the leaves. A shrub.

Cascara Sagrada. Small, in umbel-like clusters. An evergreen shrub or small tree.

Quinine Bush. In drooping catkins of 2 sexes. A shrub.

California Bee-plant. Corolla globular, upper lip erect.

Bird-beak. Nearly hidden within green calyx, upper lip beak-like and protruding.

BROWN

Mission Bells. Nodding in a raceme; leaves in whorls.

Chocolate Lily. Flowers 1 to 3, leaves scattered, mostly near the base.

Lady's Slipper. Flower an inflated sac, 2 wavy-twisted lateral petals, and stringy sepals.

Wild Ginger. Bell-shaped, the 3 divisions extended into long tails.

Cancer Root. Small, 2-lipped, solitary on long branched stalks. A leafless parasite.

Cone Flower. Composite with yellow rays, and conspicuous brownish purple disk becoming conical in age.

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